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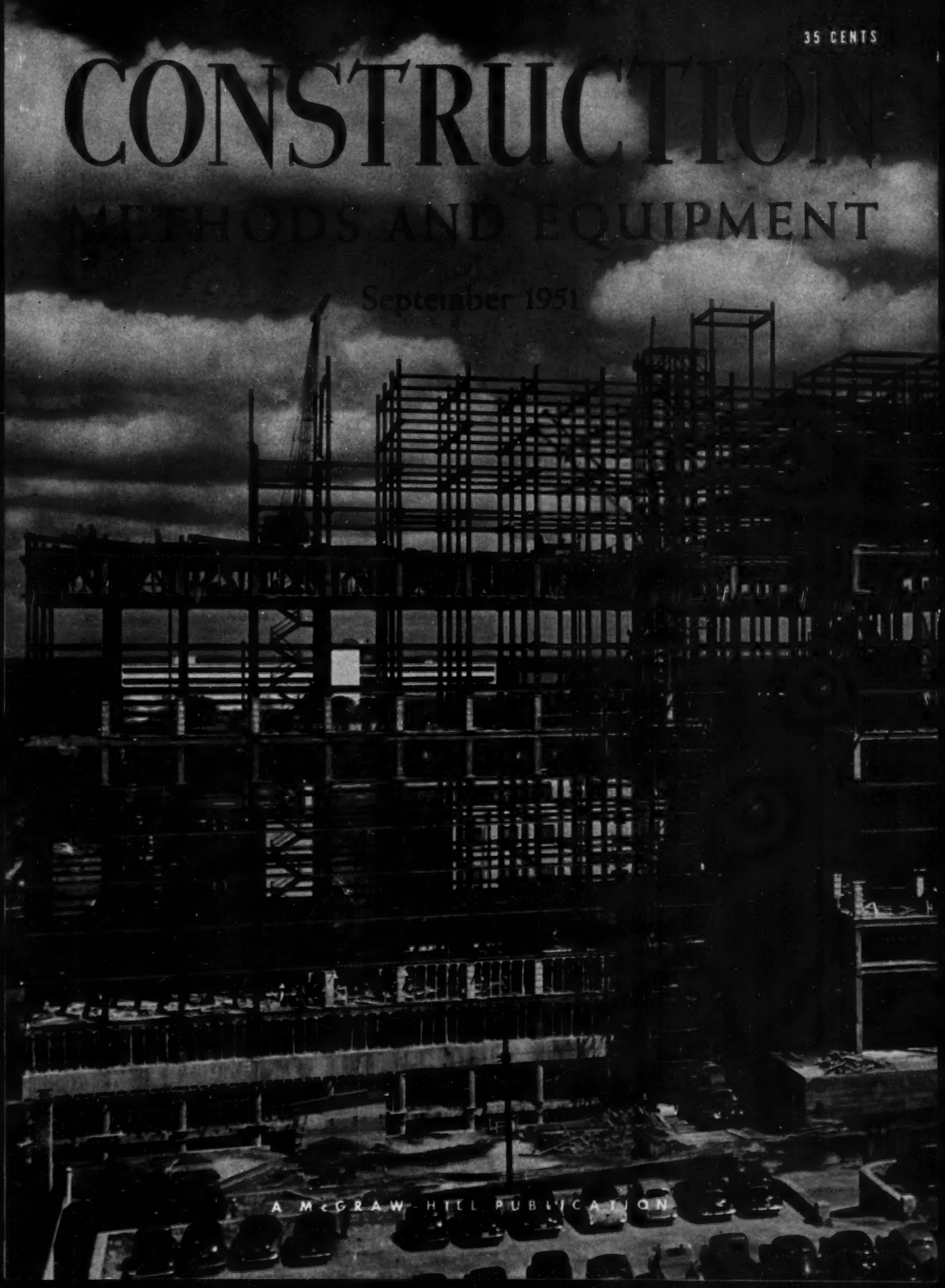
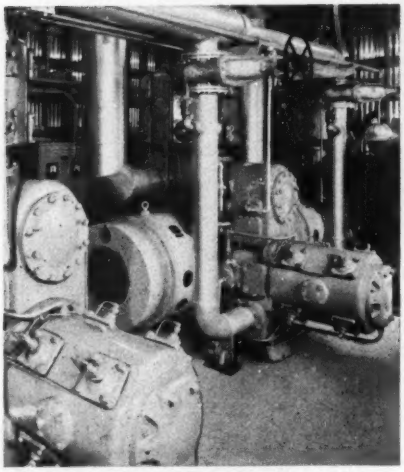
CONSTRUCTION METHODS AND EQUIPMENT

September 1951

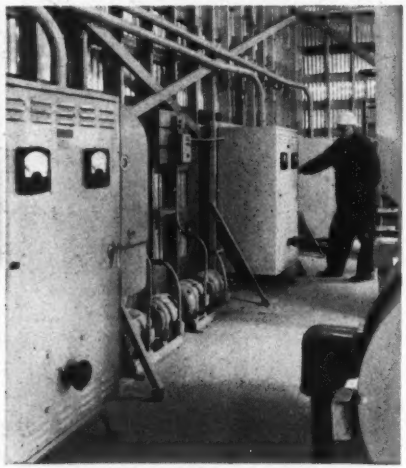


A McGRAW-HILL PUBLICATION

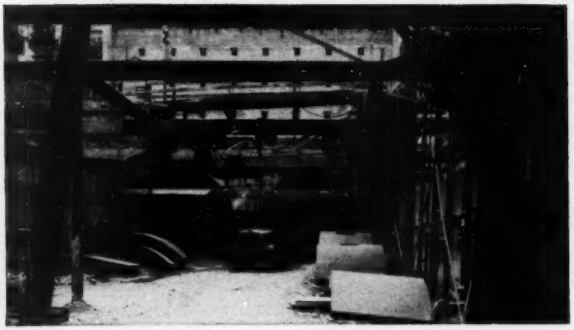
San Francisco's new twin-bore tunnel will be 3400 ft long portal-to-portal with a 1600-ft enclosed bore. Air for the construction tools and equipment is distributed from a central source under 100-lb pressure through 6-in. pipe.



A G-E 150-hp 440-volt, 600-rpm synchronous motor drives each of the three 930-cfm Ingersoll-Rand compressors. Motors and compressors run 24 hours a day, five days a week.



G-E control for each motor consists of a semi-magnetic starter providing reduced-voltage starting and complete motor protection. G-E motor-generator sets supplying field current are controlled by G-E magnetic starters mounted above them.



AIR for BOTH TUNNELER AND TRAVELER ... *Electrically*

G-E motors and control drive compressors for construction equipment and permanent ventilating blowers at San Francisco's Broadway Tunnel

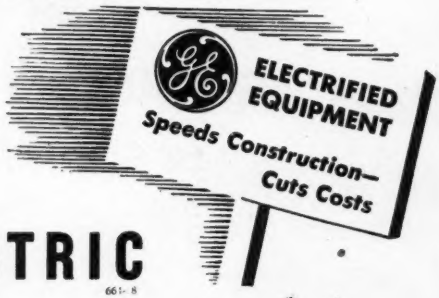
Compressed air to operate the more than 100 tools, hoists, and muckers being used by the Morrison-Knudsen Construction Co. in work on San Francisco's Broadway tunnel is supplied by centrally located compressors driven by G-E motors and control. Used in place of numerous individual units, the central air supply cuts maintenance costs and adds flexibility to the tunneling operation.

Expressing complete satisfaction with the system, Assistant Project Manager Harry Kirmond reports outstanding performance from G-E drives: *no unscheduled downtime has been charged to the drives up to the halfway mark in the two-year project.* And when the tunnel is complete, G-E equipment will still be on the job in the form of ventilating-equipment drives, and complete distribution facilities for lighting.

This is another excellent example of the flexibility, speed, and economy that G-E electrification can give you on construction jobs. ***General Electric Company, Schenectady 5, N. Y.***

Ask him Today!

Whether you buy or build construction equipment, your G-E representative can show you how to do a better job—at lower cost—by complete electrification. Write him now, and he'll call on you at your convenience.



GENERAL ELECTRIC

661-8

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER

Hauls 33 tons of clay for a penny —now in its 25th year

THIS conveyor belt carries clay, used in making bricks, from a crusher up that steep incline to storage bins. Installed in 1926, this B. F. Goodrich belt has cost the brick company only $18 a year, is still in use, good for many thousand more tons. Here's why this B. F. Goodrich belt can be counted on for years of extra service:

Greater flexibility—The square-edge construction, found only in BFG belts, insures greater flexibility, helps the belt travel more easily, with less strain, less wear. This is because each layer of top and bottom ply fabric runs only from one edge of the belt to the other. There's no folding over of a ply to make it serve as part of the next fabric layer. Edges are bonded, won't separate. Belt troughs perfectly whether loaded or empty.

All fibers put to work—Uniform tension is maintained throughout every step of building the belt. In completed belt, all fibres work together; none "go along for the ride", none is taxed by overload.

Special rubber used—Chemicals developed by B. F. Goodrich are added to the rubber to resist the effects of age. These special anti-oxidizing agents keep the rubber "live" and elastic.

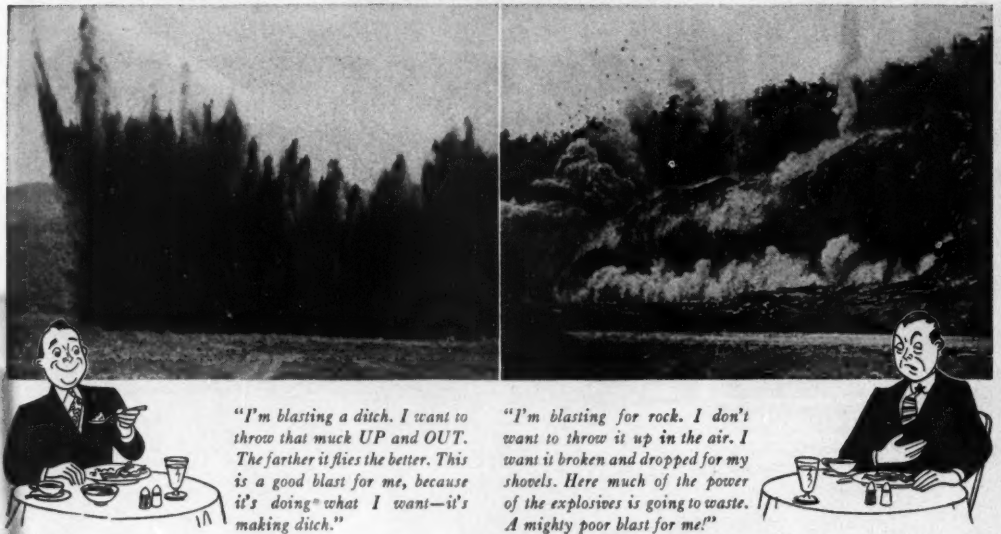
These are some of the reasons B. F. Goodrich can furnish a belt like the one in the picture—one that far outlasts other medium-priced belts, one that makes a record for savings, one that can cut the costs of hundreds of industrial operations. Your local B. F. Goodrich distributor will show you how a BFG belt can save you money. Or write *The B. F. Goodrich Company, Industrial & General Products Division, Akron, Ohio.*

Conveyor Belts BY

B.F.Goodrich

RUBBER FOR INDUSTRY

"One man's meat is another man's poison..."



"I'm blasting a ditch. I want to throw that muck UP and OUT. The farther it flies the better. This is a good blast for me, because it's doing what I want—it's making ditch."

"I'm blasting for rock. I don't want to throw it up in the air. I want it broken and dropped for my shovels. Here much of the power of the explosives is going to waste. A mighty poor blast for me!"

The blast that is just right for one operator may be all wrong for another. A ditching shot like the one at left above is meat for the farmer or agricultural engineer. But such throw is strictly poison for blasting work in quarries, strippings and most construction jobs.

The ROCKMASTER Blasting System gives better control over explosives force—enabling you to strike the proper balance between throw and breakage—to suit *your* job.

Your Atlas representative will be glad to help you use the proper combination of the 16 available ROCKMASTER split-second delay detonators, plus explosives and loading methods especially suited to your requirements.

Write today for the ROCKMASTER "16" booklet, showing typical loading diagrams for several types of quarrying, stripping and construction blasting operations. It's yours for the asking.

Less Bark *More Bite*

ROCKMASTER "16" TIMINGS

Rockmaster No.	Avg. Time of Each Delay from Zero (milli-seconds)
0 (zero)	0 (inst.)
1	8
2	25
3	50
4	75
5	100
6	125
7	150
8	175
9	200
10	250
11	300
12	350
13	400
14	450
15	500
16	550

ROCKMASTER: Reg. U.S. Pat. Off.

ATLAS EXPLOSIVES

"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

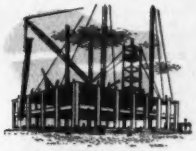
For Logging

For Sand and Gravel

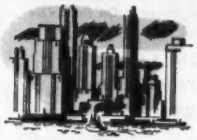
For Aircraft

For Marine

For Stone Quarries



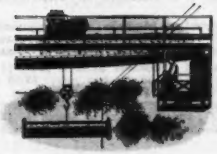
For Construction



For Elevators

For Mining

For Drilling



For Industrial

For better service and more economy

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PREformed...Internally Lubricated

WIRE ROPE

A thousand and one **to order from assures the right rope for your equipment**

It will pay you to get Macwhyte Wire Rope, engineered and job-proved for your particular equipment. Over the years, ropes for all types of equipment in every field have been developed by Macwhyte. Recommendations are promptly available from Macwhyte distributors or Macwhyte Company. You get the correct wire rope for your equipment when you buy Macwhyte.

MACWHYTE COMPANY, 2941 Fourteenth Avenue, Kenosha, Wis. Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Rope. Catalog available on request. Mill depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle • San Francisco • Los Angeles • Distributors throughout U.S.A.

BULLETIN 5025 gives information on "How to order Wire Rope" and lists all sizes and constructions of Improved Plow Steel Monarch Whyte Strand Wire Rope. Copy sent on request.

"We build MORE foundations AT LOWER COST WITH SYMONS FORMS"

Simple, sturdy hardware assures fast erection and fast stripping. Without nuts, forms are twice as long. Contractors report substantial savings in labor and material costs as well as important savings in time.

Panels with steel ribs every 12 inches are recommended for heavy pressure. Plain plywood 5/8" panels provide practical economy for lighter pressure.

Raw Plywood, Plastic Plywood or Magnesium forms are available with hardware to build your own. Symons forms may be rented with purchase option, depending on engineered form layout.

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CONSTRUCTION METHODS AND EQUIPMENT

Volume 33, Number 9 **SEPTEMBER 1951** Established 1919

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September 1951 **CONSTRUCTION METHODS AND EQUIPMENT** Vol. 33—No. 9
Member ABC and ABP

Published monthly by McGraw-Hill Publishing Co., Inc., James H. McGraw (1860-1948), Founder. Publication office, 330 W. 42nd St., New York 18, N. Y.

Executive, Editorial and Advertising offices: McGraw-Hill Building, 330 W. 42nd St., New York 18, N. Y. Curtis W. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President, Publications Division; Ralph B. Smith, Editorial Director; Nelson Bond, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Director of Circulation.

Subscriptions: Address correspondence to Construction Methods and Equipment—Subscription Service, 330 W. 42nd St., New York 18, N. Y. Allow ten days for change of address. Please indicate position and company connection on all subscription orders.

Single copies 35¢. Subscription rates—United States and possessions $2.00 a year; $3.00 for two years; $4.00 for three years. Canada $4.00 a year; $6.00 for two years; $8.00 for three years. Pan America $6.00 a year; $10.00 for two years; $12.00 for three years. All other countries $15.00 a year; $30.00 for three years. Re-entered as second-class matter July 14, 1949, at the Post Office at New York, N. Y., under the Act of March 3, 1879.
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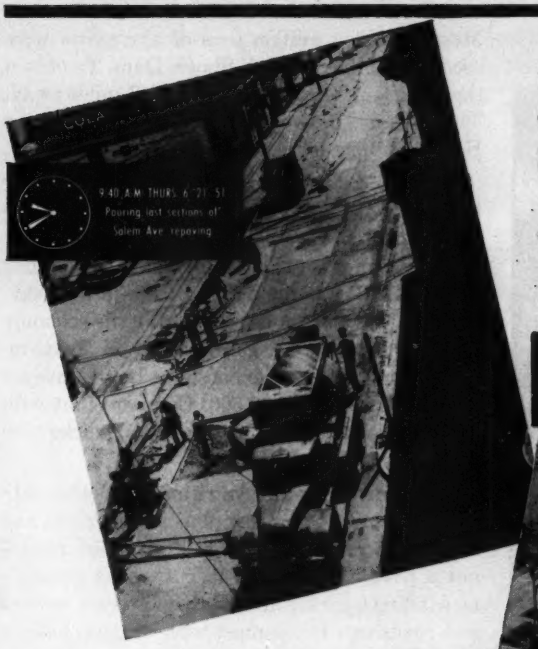
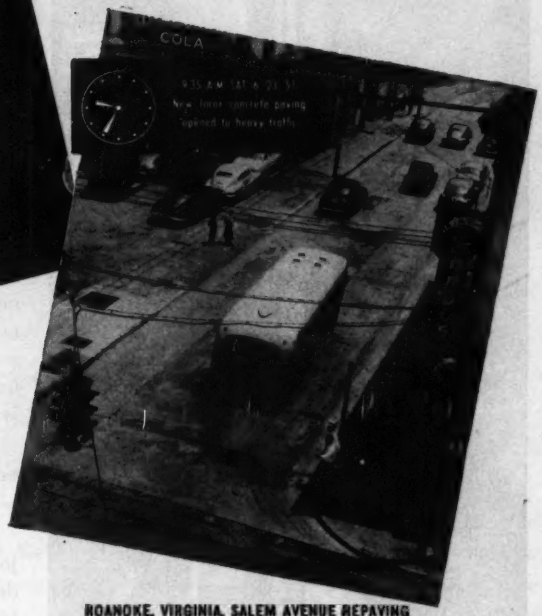
THE PUBLIC BE *PLEASED!*



Roanoke, Like Many Other Well-run Cities, Repaves with 'Incor' —Saving Motorists' Time and Tempers



ROANOKE, VIRGINIA, SALEM AVENUE REPAVING
Engineers: CITY OF ROANOKE ENGINEERING DEPARTMENT
JOHN L. WENTWORTH, Director of Public Works
H. C. BROYLES, City Engineer
Contractor: PIONEER CONSTRUCTION CO., INC., Roanoke
Ready-Mix 'Incor' Concrete: CONCRETE READY MIXED CORPORATION, Roanoke

● Closing a busy street like Salem Avenue in Roanoke, Virginia, for repaving can be a prolonged headache for motorists, a serious trade loss for merchants. But not if the city follows a policy of the public be PLEASED:

Like John L. Wentworth, Roanoke's Director of Public Works, who used 'Incor' 24-Hour Cement for repaving busy Salem Avenue from Jefferson Street, W., to Second Street, S. W.

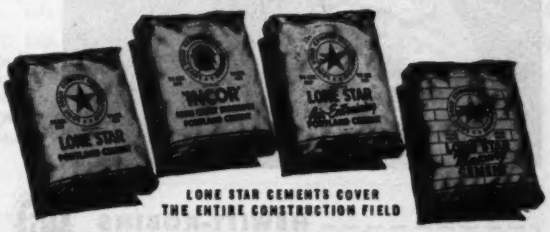
Placed one day, 'Incor' concrete carried heavy mixer trucks the next. Result, Mr. Wentworth estimates a saving of 45 days' traffic tie-up.

Salem Avenue is typical of many a busy main stem the country over. With 'Incor,' motorists praise the foresight of progressive city fathers . . . merchants save sales that would otherwise be lost.

Good news for taxpayers, too . . . because dependable 'Incor'* high EARLY strength saves at the go in . . . dependable high ULTIMATE strength saves tax outgo, through extra years of maintenance-free service.

Serving public convenience today and the public pocketbook tomorrow . . . backed by nearly 25 years' dependable performance . . . deservedly, America's FIRST high early strength Portland cement.

*Reg. U.S. Pat. Off.



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LONE STAR CEMENT CORPORATION

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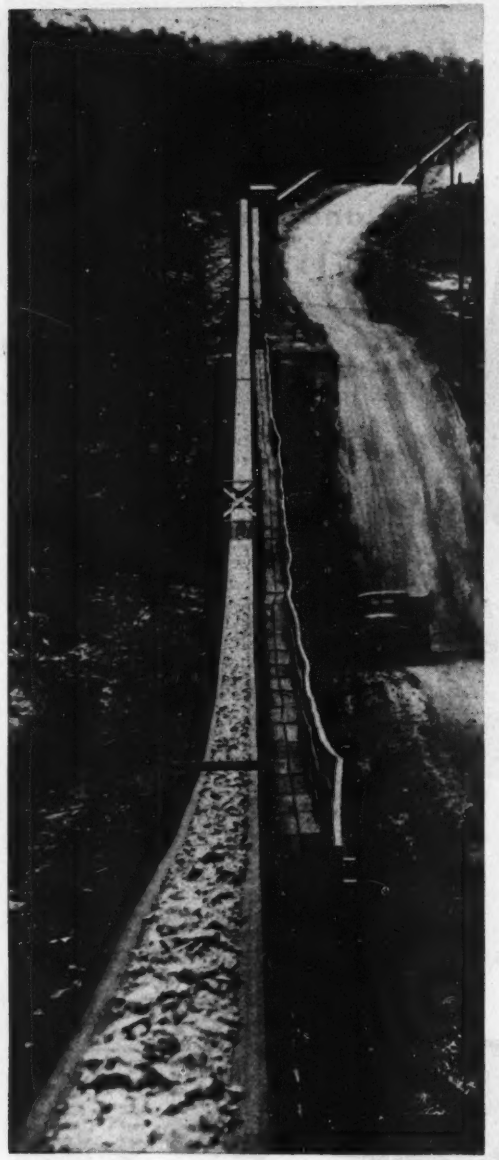
LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 17 MODERN MILLS, 125,000,000 SACKS ANNUAL CAPACITY

Mountain Moved 7 Miles @ 4½¢ per Ton-Mile



More than 4½ million tons of aggregates were used in building the Bull Shoals Dam. To obtain the rock, a mountain was leveled 7 miles away. The material moved those 7 hilly miles over Hewitt-Robins idlers *for only 4½¢ per ton-mile.*

Flippen Materials Co. acted wisely in selecting belt conveyors. They saved $560,000 on purchase *and installation* vs. a fleet of trucks, a 7-mile highway and incidentals. They saved another $375,000 in 2½ years on man-hours—a total saving of $935,000 without considering the economy of electric power over gasoline and oil. Total replacement and repair expense for Belt Conveyor Idlers was less than $2,500. Compare that with the expense of keeping 30 twenty-ton trucks (and their tires) rolling 2½ years!

Belt Conveyors offer you numerous other substantial benefits. For installation, operation and maintenance, you need a primitive dirt road—not a paved highway. You cut across grades—no winding for miles around them. Rivers, ravines and roads can be spanned with bridges *made of wood.* When tunneling is inevitable, a simple hole is adequate.

Hewitt-Robins offers three types of Belt Conveyors—engineered, sectional and low sectional—able to meet every construction-project need.

Before you bid on another highway or dam job, consider belt transportation. Send us the details, including topographical maps, for an unbiased analysis. We will tell you—honestly and factually—whether belt conveyors will save you time, trouble and money. Address Contractors' Service Dept., Robins Conveyors Division, Hewitt-Robins Inc., 270 Passaic Ave., Passaic, N.J.

Hewitt-Robins is participating in the management and financing of Kentucky Synthetic Rubber Corporation.

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Euclid Scrapers

Make the dirt fly!

Owners in every part of the country report outstanding performance and production with the new Euclid Scraper. It has proved its efficiency and dependability on a wide range of work—construction of roads, airports, levees and in open pit mining.

These features assure top scraper performance ... struck capacity 15.5 cu. yds., 20 cu. yds. heaped ... 10 speed transmission ... 275 h.p. engine ... top speed with full payload 28.2 m.p.h. ... high lift apron and positive roll-out ejector dump loads fast and clean ... four wheel Euclid tractor provides easy, positive steering and has ample power, traction and flotation for fast loading and travel on steep grades and soft fills.

Call your Euclid Distributor or write direct for information on this Euclid Scraper ... the easiest handling and most efficient loading, hauling and spreading scraper for your work.

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

MORE LOADS PER HOUR—
MORE PROFIT PER LOAD

CABLE ADDRESS: YUKLID CODE: BENTLEY

EUCLID

B.F.Goodrich

Pick your toughest hauling job— hand it to these tires

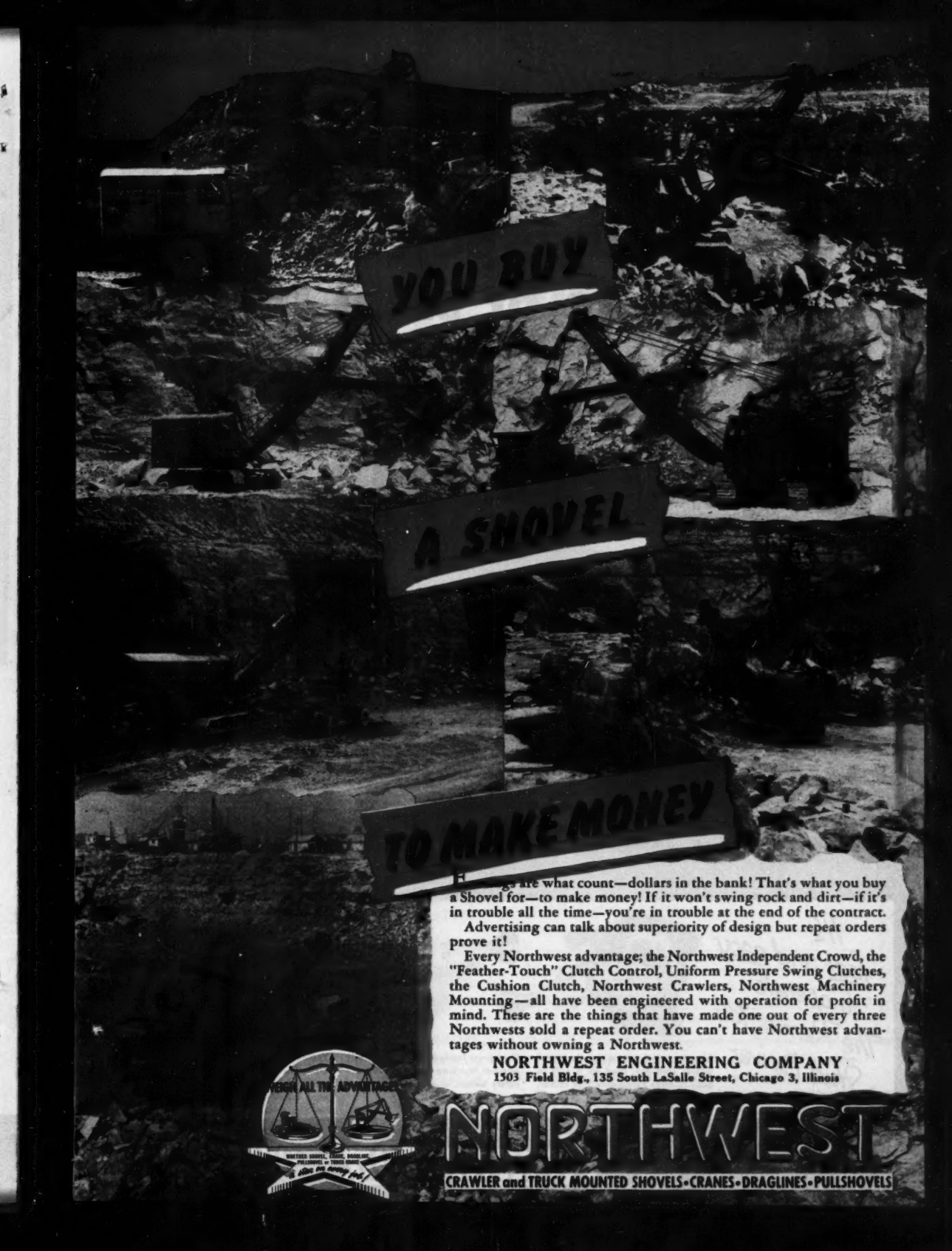
ROSCOE KREAGER, Supt., right above, watches a loading operation at the quarry of the Woodville Lime Products Company at Woodville, Ohio. Here, Mr. Kreager sees a giant crane dump a bucket of limestone into a trailer equipped with B. F. Goodrich Universals. This is a year-round operation at Woodville as the company processes limestone, fertilizers and other kindred products for nation-wide sales.

Some thirty vehicles are used by this company for intraplant stone hauling. According to Kreager, BFG Universals are used on all of these vehicles, and the company is well pleased with the performance of the B. F. Goodrich tires on these vehicles. Subjected to exceptionally hard wear, they travel over stone and razor-sharp rocks with equal traction in forward or reverse gears because they are nondirectional!

B. F. Goodrich Universal tires were selected on the basis of service and quality. These tires have greater bruise resistance and greater ability to absorb and withstand shocks because they're built with the patented *nylon shock shield*. Strong, protective layers of nylon are built in between the tread rubber and the cord body of all BFG tires of 8 or more plies . . . and at no additional cost to you.

There's a special B. F. Goodrich tire for every off-the-road service. See your local dealer. Let him help you get the benefits of longer tire life and lower operating overhead. *The B.F.Goodrich Company, Akron, Ohio.*

RESEARCH KEEPS
B.F.Goodrich
FIRST IN RUBBER



...are what count—dollars in the bank! That's what you buy a Shovel for—to make money! If it won't swing rock and dirt—if it's in trouble all the time—you're in trouble at the end of the contract.

Advertising can talk about superiority of design but repeat orders prove it!

Every Northwest advantage; the Northwest Independent Crowd, the "Feather-Touch" Clutch Control, Uniform Pressure Swing Clutches, the Cushion Clutch, Northwest Crawlers, Northwest Machinery Mounting—all have been engineered with operation for profit in mind. These are the things that have made one out of every three Northwests sold a repeat order. You can't have Northwest advantages without owning a Northwest.

NORTHWEST ENGINEERING COMPANY
1503 Field Bldg., 135 South LaSalle Street, Chicago 3, Illinois

NORTHWEST

CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

Announcing

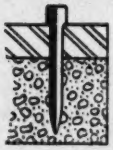
REMINGTON

New cartridge-powered tool concrete or steel in one

It's fast and easy to operate The Remington Stud Driver

Simply hand-assemble stud and power cartridge, load as a unit in easy-to-open Remington Stud Driver, and close.

Then press loaded Stud Driver firmly against working surface, depress safety button, and pull trigger.



Explosive charge imbeds stud solidly. Open Stud Driver with a twist of the wrist, eject empty shell, load next stud. Whole job takes seconds!

"If It's Remington, It's Right!"

Remington

DUPONT

MODEL 450

STUD DRIVER

fastens steel or wood to *lightning-fast* operation

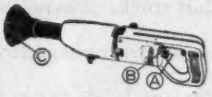
LOOK AT ALL THESE FEATURES

COMPACT AND PORTABLE. Weighs only 5½ pounds, ideal for scaffold, ladder and overhead work. Comfortable to use in any position, perfect for inaccessible places.

SPEED. One man can set up to 5 studs in a minute. Entire mechanism designed for speed, from loading to pulling the trigger to ejection of shell. Stud is set at whatever depth is required—up to 2¾ inches, depending on material.

ELIMINATES INVESTMENT IN OUTSIDE POWER. Operator has all the equipment needed right in his hand. Excellent for use in isolated areas.

TRIPLE SAFE. Remington Stud Driver has plainly visible red dot indicator (A) to show when it's cocked, safety (B) that must be depressed before and during squeezing of main trigger, and permanently attached safety shield (C) that must be compressed against work before the Stud Driver will operate. Trigger is well protected, cannot be tripped accidentally. Has only slight recoil and low noise level.



WIDE VARIETY OF STUDS are available for every fastening job—every stud trade-marked for the user's protection. Pull-out resistance as high as two tons in good concrete, depending on the stud used. Cartridges are available in 5 different power loads, covering all possible fastening requirements—any stud instantly assembled with any cartridge.

RUGGED. All working parts of the Stud Driver are made of heat-treated alloy steels, housing of strong, lightweight aluminum that carries no operating stress. Lining of safety shield is a solid block of tough, resilient Du Pont neoprene.

PRICE for Model 450 Remington Stud Driver—only $119.50—complete in rugged steel carrying case. Initial production and distribution may not keep pace with demand, but every effort will be made to fill orders as promptly as possible.

Sets fastening studs as fast as 5 per minute...needs no outside power source

Here's a tool that can truly revolutionize your construction fastening methods—speed jobs and cut costs. In a matter of seconds, the Remington Stud Driver firmly fastens steel or wood structural pieces and fittings to concrete or steel surfaces. It's as much as 100 times faster than methods now widely used. And this simple tool does the entire job...requires no outside power source or equipment. It's compact, portable, rugged...and safe.

Proved by exhaustive tests to be the finest fastening system ever devised, the Remington Stud Driver is made by Remington Arms Company, Inc., America's oldest and foremost gunmakers. To obtain detailed information on this time- and money-saving tool, and for the name of your nearest distributor, fill out and mail the coupon below.

Remington Arms Company, Inc.
Industrial Tool Division
933 Barnum Ave., Bridgeport 2, Conn.

I am interested in obtaining detailed information on the Remington Stud Driver Model 450.

*Name*_____

*Firm*_____

*Position*_____

*Address*_____

*City*_____ *State*_____

ALL THESE JOBS...AND MANY MORE!

1. Hanging steel sash and door bucks to concrete and brick.
2. Anchoring wood plates to concrete floors and ceilings for setting partitions.
3. Fastening wood furring strips to concrete for attachment of metal lath.
4. Anchoring suspended ceilings, hangers, sprinkler systems and lighting fixtures to concrete.
5. Attaching conduit and panel boxes to steel and masonry.
6. Anchoring light machinery to concrete pads.
7. Erection of signs, awnings and blinds on steel or masonry.
8. Hanging radiator housings to concrete or brick.
9. Fastening soil pipe hangers to concrete.
10. Fastening 2 x 4's to steel structurals.

WINSLOW FILTERS ON WAUKESHA ENGINES LENGTHEN OIL USE 400%

Put yourself in the place of Supt. R. F. Kohn, of Lake Mining Co.'s Embarass Mine, at Biwabik, Minn. You have a fleet of 24 big Dart trucks powered by fine Waukesha engines, but you're troubled by high oil sump temperatures and by dust, shop dirt and other contaminants in your bearings. So you decide to test filters, and in August, 1949, you put a Winslow Model 8-931-C Full-Flow Filter on a test truck and watch for results. And what results! Oil temperatures drop from 225° F. to 185° in the engine oil casing. After 2950 hours of operation, you dismantle the engine and find the engine block clean and no dirt in the bearings. Where you had scheduled oil changes every 500 hours, you now need them only every 2,000 hours! Yes, put yourself in Mr. Kohn's place, and you'll follow his lead still further. You'll convert your entire fleet to Winslow Full-Flow Filters. It saved money for him. It will save money for you!

Here is the Winslow Lubricating Oil Conditioner, Model 8-931-C, installed on one of the Waukesha Model WAK engines at the Embarrass Mine.

WRITE FOR YOUR COPY OF OUR POPULAR BOOKLET, "THE CASE OF THE DIRTY DRIP." *IT'S FREE!*

WINSLOW FILTERS

513-T-1

Winslow Engineering Company 4069 Hollis Street • Oakland 8, California

NEW Whiteman

MODEL "C" FLOATING AND FINISHING MACHINE

Model C is the latest and greatest in the ever-expanding line of Whiteman Floating & Finishing Machines that have proven their high efficiency, superior performance and rugged durability to contractors all over the world over. It incorporates numerous important new features developed over the many years Whiteman has pioneered the finishing machine.

FLOATING: With the trowels adjusted for floating, it quickly compacts the slab, drives out air pockets, brings up moisture and produces a consistent surface ready for finishing.

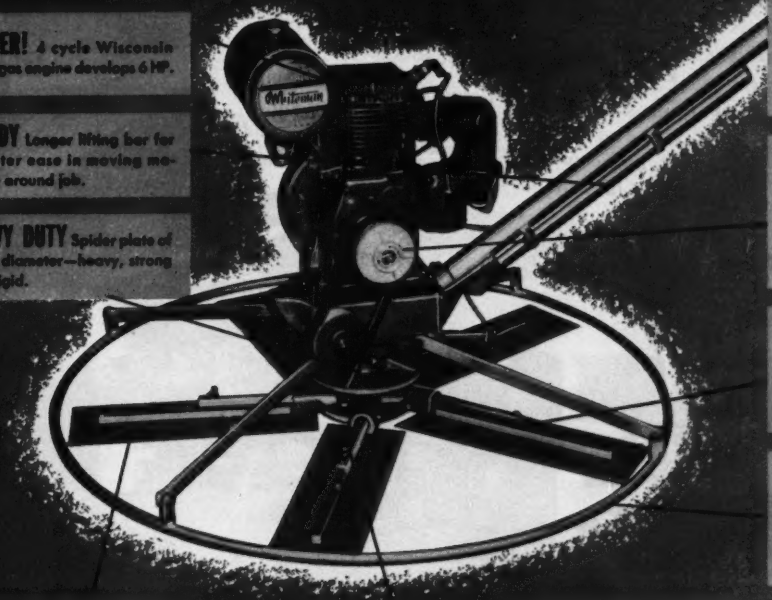
FINISHING: The same trowels are used for finishing simply by adjusting the pitch with the easy-to-reach knob at top of the handle while the machine is in motion. It produces an extremely smooth, dense surface, especially suitable for heavy duty slabs. Send coupon below for details now.

Greater than ever!

POWER! 4 cycle Wisconsin AKN gas engine develops 6 HP.

HANDY Longer lifting bar for greater ease in moving machine around job.

HEAVY DUTY Spider plate of small diameter—heavy, strong and rigid.



NEW HANDLE
Wider handle with comfortable rubber grips gives easier control of machine at all times.

NEW CLUTCH
Double groove clutch transmits more horsepower through two belts. Improved clutch pulley ratio INCREASES TROWEL SPEED 25%.

NEW-5 TROWELS
5 trowels with 10° lead give smoother operation.

NEW GUARD RING
Stationary guard ring permits machine finishing within 1½" of walls, columns, etc.

NEW UNIVERSAL TROWELS
Tool steel trowels can be used for both floating and finishing, eliminating trowel change.

NEW ARM ADJUSTMENT
Individual adjustment on each trowel arm allows perfect alignment of trowels at all times, insuring full 44" surface contact.

CONTROL! Trowel pitch can be adjusted while machine is in motion, a patented exclusive Whiteman feature.

NEW WEIGHT
20% increase in weight helps speed all jobs—especially adapted to patent method and heavy duty floors.

Whiteman
CONCRETE EQUIPMENT

WHITEMAN MANUFACTURING CO.
3249 Casitas Ave. Dept. C., Los Angeles 39, Cal.
Please send me literature and prices on new Whiteman Model C Floating-Finishing Machine and name of nearest distributor.

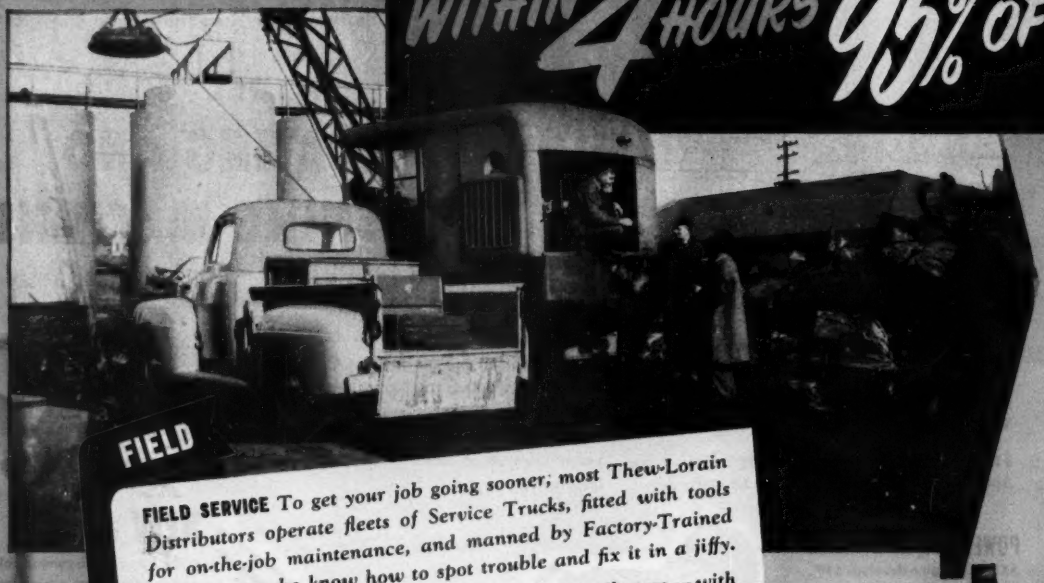
Name_____

Firm_____

Address_____

City_____ Zone____ State____

WITHIN 4 HOURS 95% OF

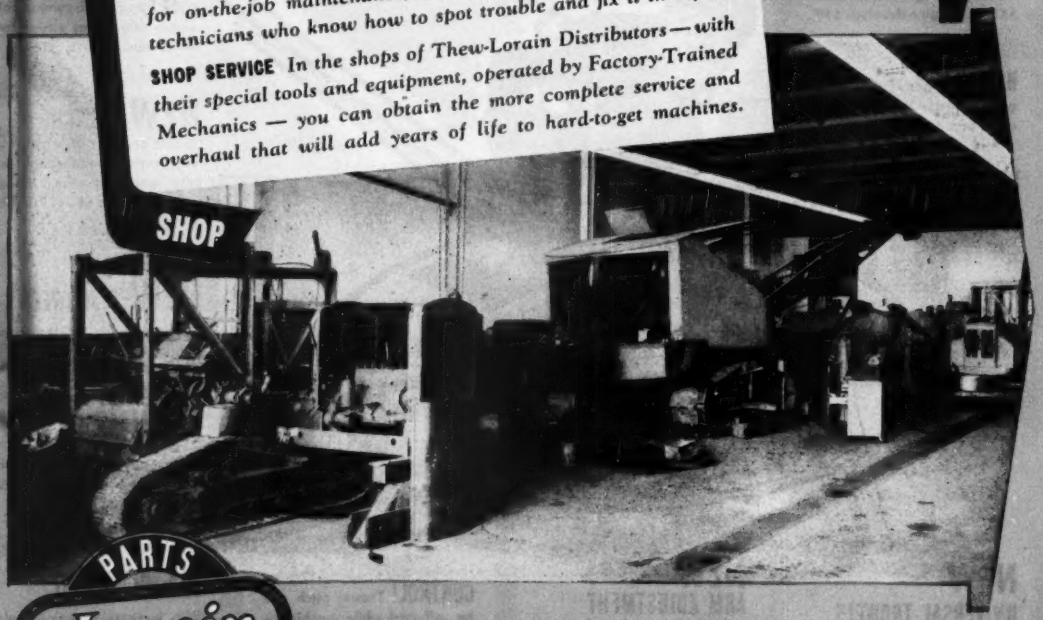


FIELD

FIELD SERVICE To get your job going sooner, most Thew-Lorain Distributors operate fleets of Service Trucks, fitted with tools for on-the-job maintenance, and manned by Factory-Trained technicians who know how to spot trouble and fix it in a jiffy.

SHOP SERVICE In the shops of Thew-Lorain Distributors — with their special tools and equipment, operated by Factory-Trained Mechanics — you can obtain the more complete service and overhaul that will add years of life to hard-to-get machines.

SHOP



PARTS

THEW Lorain SERVICE

LOOK FOR THIS EMBLEM on Service Trucks and Buildings! It's the sign of

THEW LORAIN

"Keep 'Em Digging"

SERVICE AND PARTS!

MEN AT WORK — LEARNING...

Here's one group of the 265 Distributor men who have "graduated" from the factory service training program. These men learn on actual equipment, follow factory-recommended procedures for fastest maintenance, best results.

Lorain owners can get *FACTORY TRAINED* service from their nearby LORAIN Distributor

KEEP 'EM DIGGING—

. . . that's the important thing today! And the Thew-Lorain distributor organization offers you a two-edged approach to the vital job of keeping your present machines in operation.

265 SERVICE TECHNICIANS have graduated from the Thew-Lorain Factory Training Course and are well qualified to give you the full benefit of their experience and "know-how". As many as 95% of Thew-Lorain owners can call one of these trained men to their job when needed — in a maximum of 4 hours by car, and in much less time than that in thickly populated areas.

ON-THE-SHELF-PARTS are stocked by most Thew-Lorain distributors to the extent that 97% of all Lorain owners are never more than 8 hours by car (2 hours by air) from a Distributor capable of supplying at least 70% of needed parts right off his shelves.

Combine these skilled and trained Lorain technicians, only a few hours away, with on-hand Lorain-Engineered Parts and you have an unbeatable combination . . . and one of the big important advantages that protect the investment of every Lorain owner and keep Lorains on the job for many years. If you want to "keep 'em digging" in the days and years ahead, your Thew-Lorain Distributor is the man to see!

THE THEW SHOVEL CO., LORAIN, OHIO

THEW LORAIN

SHOVELS • CRANE • DRAGLINE • HOES • CLAMSHELLS • MOTO-CRANES

KEEP

DRILLS of all types run better with *Texaco Rock Drill Lubricant EP*. One user states: "We are amazed at the performance of this oil in comparison with what we had been using. We have cut oil consumption 50% and have shown a remarkable reduction in maintenance on all our drills."

What's the best air compressor oil to keep your compressors working and your maintenance costs low? That depends on your operating conditions. But it *must* be an oil especially designed to meet those conditions. Texaco has it. For example—

** To assure clean operation and reduce wear under *normal conditions*, use a Texaco *straight mineral* air compressor oil.

** To *overcome rust* conditions in compressors,

TEXACO

TEXACO

AIR COMPRESSORS ON THE JOB—

regardless of operating conditions

...with TEXACO air compressor oil

inter- and after-coolers, lines and receivers, use a Texaco *rust-inhibited* air compressor oil.

** To *avoid carbon and gum* formations, use a Texaco heavy-duty air compressor oil, with special detergent and oxidation-resistant properties.

** To *eliminate excessive wear* caused when moisture condensation in cylinders washes away lubricant, use a Texaco *compounded* air compressor oil.

A Texaco Lubrication Engineer will gladly help you select the one proper Texaco air compressor oil to assure you greater efficiency and lower costs under your particular operating conditions. And don't forget to ask him about the Texaco Simplified Lubrication Plan for *all* your equipment. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

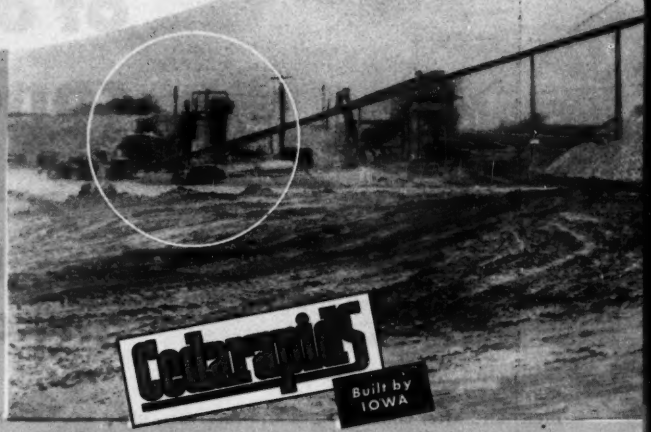
The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

AGGREGATE

14,472 TONS!
The Peak Day's Production at Concrete Materials & Construction Co.
—Average Daily Production 600 TONS PER HOUR!



THIS CEDARAPIDS DOUBLE IMPELLER IMPACT BREAKER is really turning out the tonnage! On their New Jersey Turnpike contract, Concrete Materials & Construction Co. put through 14,472 tons of aggregate . . . 800 truck loads, at 16 to 20 tons per load . . . on their peak day, a 20-hour period when the surge pile was down and plenty of trucks were available for feed. *That's a 724 ton per hour peak production average!*

Originally scheduled to turn out around 400 tons per hour, the 5050 Double Impeller Impact Breaker in this Concrete Materials plant is consistently averaging more than 600 tons per hour. No wonder more and more contractors are depending on the bonus production of Cedarapids Double Impellers!

To meet today's demand for AGGREGATE UNLIMITED, and assure yourself of *opportunity unlimited* for profit, see your Cedarapids distributor today for the equipment you need to make *your* plant a real producer.

DOUBLE IMPELLER IMPACT BREAKERS

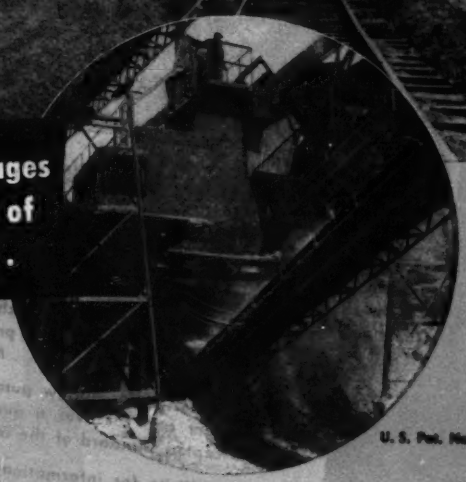
Get ready for the *big* jobs with a Cedarapids Double Impeller Impact Breaker in your plant. It's your assurance of maximum output of the cubical shaped aggregate required in so many specifications today. Because so much of the material is broken in suspension, you get an extremely high ratio of reduction at extremely low power costs. Exceptional tonnage with a minimum of connected horsepower! And you save on your plant set-up because you can eliminate much accessory equipment such as secondary crushers, conveyors, etc. You can get *immediate delivery* on Double Impeller Impact Breakers to give you OPPORTUNITY UNLIMITED right now! Four sizes available.

THE IOWA LINE *of Material Handling Equipment Includes:* ROCK AND GRAVEL CRUSHERS • BELT CONVEYORS • STEEL BINS • VIBRATOR AND REVOLVING SCREENS • UNITIZED ROCK AND GRAVEL PLANTS • FEEDERS • PORTABLE POWER CONVEYORS • PORTABLE AND STATIONARY STONE, GRAVEL AND SAND PLANTS • REDUCTION CRUSHERS • BATCH TYPE AND VOLUMETRIC TYPE ASPHALT PLANTS • DRIERS • DUST COLLECTORS HAMMERMILLS • WASHING PLANTS • VIBRATING SOIL COMPACTION UNITS • DOUBLE IMPELLER IMPACT BREAKERS

UNLIMITED

for the New Jersey Turnpike

BINKLEY BROS. PLANT averages 250 to 300 tons per hour of 3½" minus material....

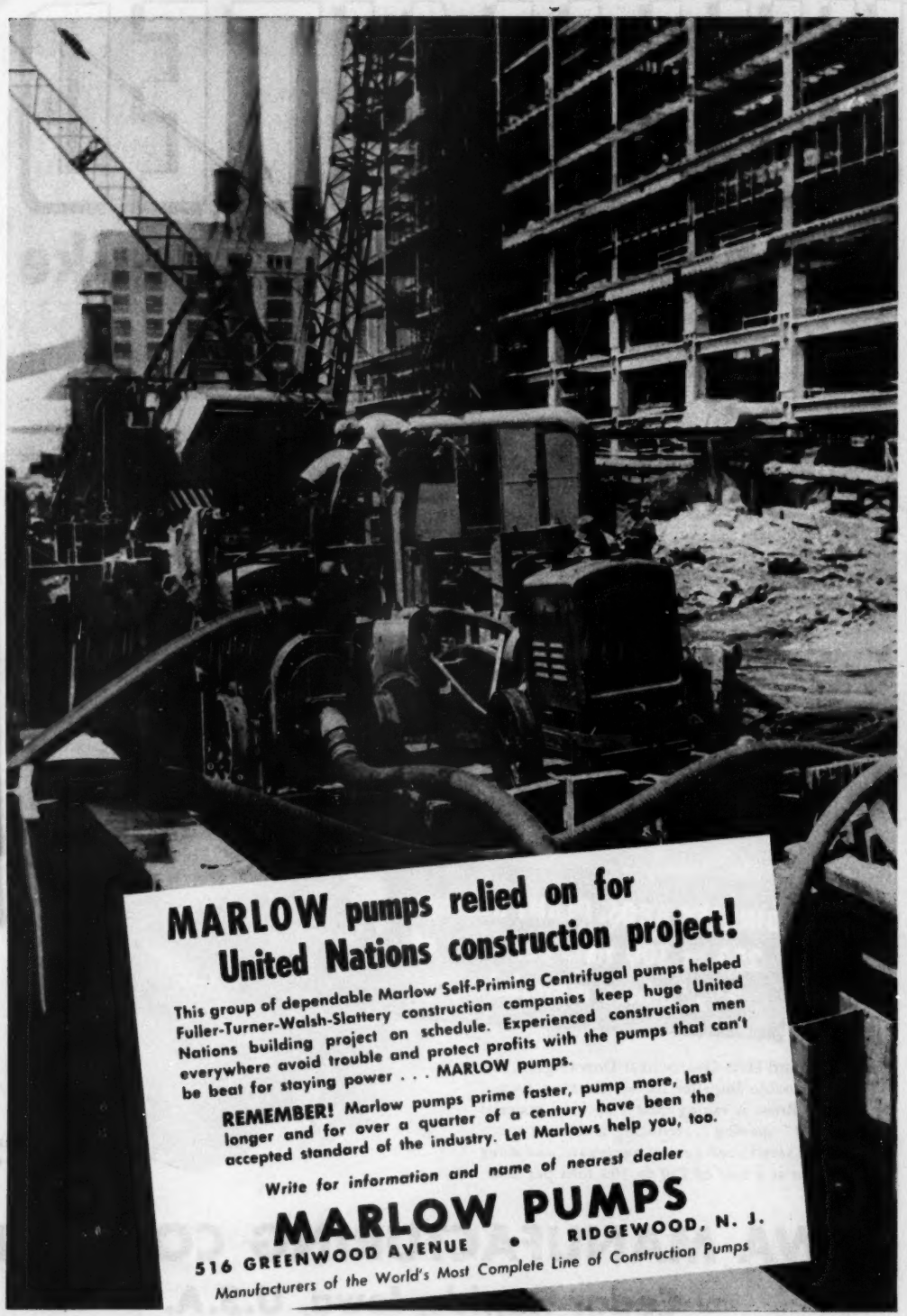


In the Bradford Hills Quarry near Downington, Pa., one 5050 Double Impeller Impact Breaker, owned by Binkley Bros., is taking quarry rock ... material passing a 50" opening ... reducing it to meet specifications for small sized cubical aggregate, *and doing it in one pass* at a rate of 250 to 300 tons per hour.

U. S. Pat. No. 2373691
3486421

IOWA MANUFACTURING COMPANY

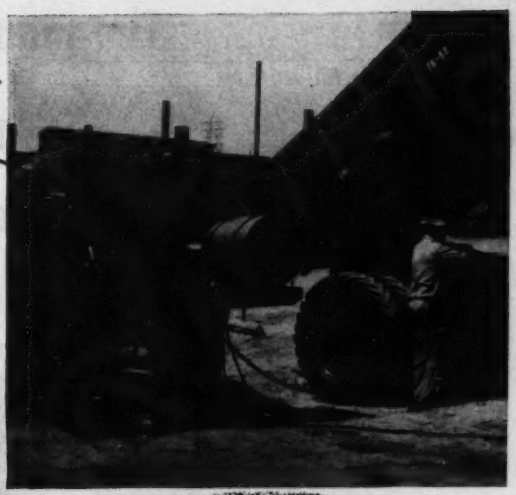
Cedar Rapids, Iowa, U.S.A.


MARLOW pumps relied on for
United Nations construction project!
This group of dependable Marlow Self-Priming Centrifugal pumps helped Fuller-Turner-Walsh-Slattery construction companies keep huge United Nations building project on schedule. Experienced construction men everywhere avoid trouble and protect profits with the pumps that can't be beat for staying power . . . MARLOW pumps.
REMEMBER! Marlow pumps prime faster, pump more, last longer and for over a quarter of a century have been the accepted standard of the industry. Let Marlows help you, too.
Write for information and name of nearest dealer
MARLOW PUMPS
516 GREENWOOD AVENUE • RIDGEWOOD, N. J.
Manufacturers of the World's Most Complete Line of Construction Pumps

MOST IMPORTANT RIGS on any job!

GRACO'S *NEW* LUBE RIGS

Keep costs down . . . yardage up!

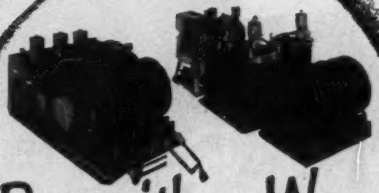


THE OLD "GREASE TRUCK" has a new look these days. Smart contractors are replacing old wasteful, makeshift methods with modern truck mounted lube rigs.

Recently re-designed and improved, Graco Convoy Lubers now feature the toughest lubricant pump ever developed for contractors' service . . . the Graco air-operated Mogul. You can get either original drum or hopper models.

The Mogul pump, available in pressure ratios of 40 to 1 and 8 to 1, is heavy-duty built to work shift after shift without attention.

Don't let improper greasing cause costly down time. Give your equipment the best care possible . . . grease, oil and air from a new Graco Convoy Luber. Send the coupon below for the new 24-page color catalog. It's yours free!



Buy either Way!

You can get Graco Convoy Lubers in either of two types: Self-contained, skid-mounted Convoy Lubers (left) are ready to slide on a truck and head for the field. New Convoy Luber catalog describes these units fully.

Job-planned Convoy Lubers (typical rig at right) are build-your-own units, designed by you to meet your own special requirements. Any combination of pumps, reels and other equipment you want. Charts in the new Convoy Luber catalog help you select the component parts. Catalog also gives suggestions for various combinations, plus information on all pumps, reels and accessories.

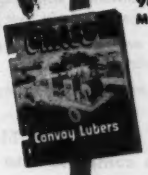
GRACO

Convoy Lubers

Product of **GRAY COMPANY, INC.**

MINNEAPOLIS 13, MINNESOTA

Sales and Service in all principal trading areas of the United States, Canada and foreign countries. District offices: New York, Philadelphia, Detroit, Chicago, San Francisco, Atlanta (opening January 1).



GRAY COMPANY, INC.,
98 Graco Square
Minneapolis 13, Minnesota

● Please send me the new 24-page Convoy Luber Catalog for contractors,

Name.....

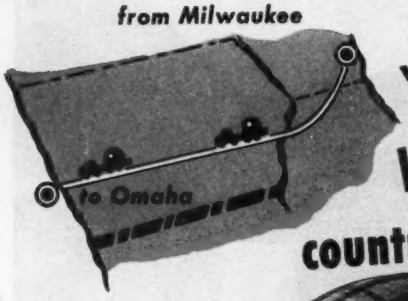
Company.....

Address.....

City.....Zone...State.....

The man* said:

"We need a special trailer to handle a tough cross-country hauling job..."

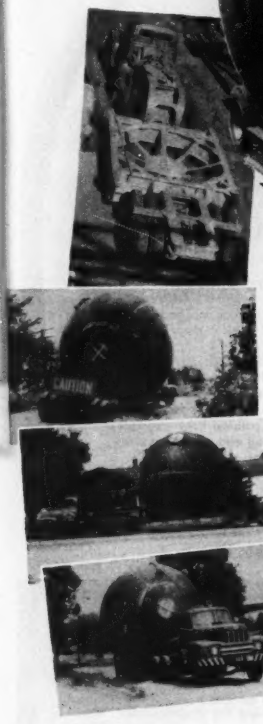


*LeROY L. WADE & SONS, INC.
Heavy Hauling Contractor
Omaha, Nebraska

the project:

Transporting 20-ton spheres, each 16 feet in diameter, 780 miles, from the Milwaukee Works of A. O. Smith Corporation to the Quaker Oats Plant in Omaha. The huge, spherical digesters were too large for railroad transportation and the time element would not permit barging—so a highway trucking plan was used.

Loading the spheres at the Milwaukee Works of the A. O. Smith Corporation prior to the trip.



some of the problems:

- must travel 780 miles instead of 500-mile direct route because of low overheads and weak bridges.
- to design and build special trailer decks for excess widths.
- to maintain sufficient road speed to make the trip in four days.
- to arrange highway police escort for entire route.
- to assure perfect safety during the haul.

A special TALBERT TRAILER with removable gooseneck* and a removable tandem section was designed for this job in conjunction with LeRoy L. Wade & Sons, Inc. An extra wide deck (10'6") was used to accommodate the 16' diameter sphere.

When this project is completed, Wade can easily convert this unit to a standard type trailer by simply putting a standard type deck between the removable tandem section and the removable gooseneck.

THE TALBERT CONSTRUCTION EQUIPMENT CO., of Lyons, Illinois manufactures a complete line of low-bed trailers and dump semi-trailers

THE TALBERT-WAY IS THE EASY WAY

On this highway job between Bardstown and Fredericktown, Ky., a 1¾-yd. Thew Lorain shovel, powered by a "Cat" D13000 Engine, loads heavy rock into Athey wagons, pulled by "Caterpillar" D7 Tractors. The contractor is W. C. Snyder, Danville, Ky.

There's a big job ahead

How your equipment stands up in the months ahead has a real bearing on America's fight to be strong and stay free. A vital part of that effort is the $12,000,000,000 worth of earthmoving and road building needed this year. And we're entering a period that will separate "the men from the boys" in the field of construction machinery.

Military needs and Defense Rated Orders are taking their share of "Caterpillar" production. Shortages of steel and other materials add to the difficulty of supplying the demand for new machines. This means that *present equipment must be kept in use.*

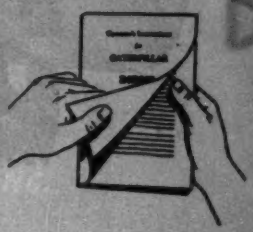
"Cat" Diesel Engines, Tractors, Motor Graders and Earthmoving Equipment are built with the stamina to serve you long and faithfully. But *how* long is up to you and the operation and maintenance you give them. Good care pays off.

You can add many hours to equipment life if you follow sound maintenance practices. Anticipate your parts needs *before* wear goes beyond repair. Talk it over with your "Caterpillar" dealer. He is qualified to give competent opinion. If a part is not readily available, he has the tools and knowledge to rebuild many worn parts — and keep your machinery on the job.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

You're the Doctor

Don't let your engine overheat. Maintain the cooling system, keeping it free of scale, rust and sediment. Use soft or treated water and, when freezing temperatures exist, protect your engine with anti-freeze. Clean the radiator periodically, removing foreign matter from the core by brushing or washing. Use chemical flushing solutions. Prevent engine troubles which come with overheating. Consult your Operator's Instruction Book.



CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES
TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

Specify UPSON-WALTON Tackle Blocks

NOT THIS HOOK—*but* THIS HOOK

No Upson-Walton hoist hooks are formed by bending. All are drop-forged *to size and shape, with substantially heavier section at critical points.*

Extra strength at no extra cost

SAFE working loads of Upson-Walton tackle blocks exceed usual safe working loads by wide margins. (See table below.) They are engineered to withstand not only the weight of the load, but hoisting strength as well. In many cases a shackle is not required.

Specify this extra strength—at no extra cost. Your Upson-Walton distributor can serve you from local stocks.

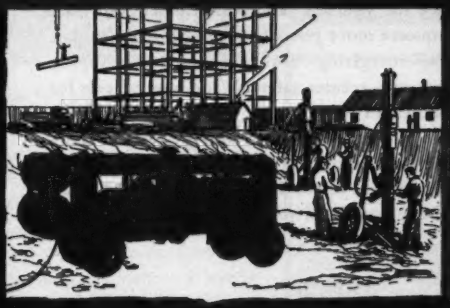
COMPARE THESE SAFE WORKING LOADS!

	Usual Safe Working Load	Upson-Walton's Safe Working Load
3" Single	200 lbs.	265 lbs.
3" Double	300 lbs.	400 lbs.
3" Triple	400 lbs.	540 lbs.
4" Single	400 lbs.	510 lbs.
4" Double	550 lbs.	730 lbs.
4" Triple	700 lbs.	925 lbs.
5" Single	500 lbs.	675 lbs.
5" Double	750 lbs.	1000 lbs.
5" Triple	1000 lbs.	1325 lbs.
6" Single	1000 lbs.	1320 lbs.
6" Double	1500 lbs.	1900 lbs.
6" Triple	2000 lbs.	2640 lbs.
7" Single	1500 lbs.	1700 lbs.
7" Double	2000 lbs.	2575 lbs.
7" Triple	2500 lbs.	3000 lbs.
8" Single	1700 lbs.	2200 lbs.
8" Double	2450 lbs.	2850 lbs.
8" Triple	3200 lbs.	3500 lbs.
10" Single	2600 lbs.	2750 lbs.
10" Double	3400 lbs.	3650 lbs.
10" Triple	4200 lbs.	4900 lbs.
12" Single	3000 lbs.	3000 lbs.
12" Double	3750 lbs.	4600 lbs.
12" Triple	4500 lbs.	5400 lbs.

THE UPSON-WALTON COMPANY

CLEVELAND, OHIO

NEW YORK • CHICAGO • PITTSBURGH



It's the new Model 600 Schramm Air Compressor . . . new, yet already established as a rugged, versatile Air Compressor providing savings up to 50%. Exclusive features make this saving possible. For the many interesting construction details of the Schramm 600, write today for Bulletin 5025.

SCHRAMM INC.

The Compressor People

WEST CHESTER • PENNA.

Stronger . . . safer . . . and money-saving, too!

CHEVROLET Advance Design TRUCKS

Strength to carry your loads . . . power to *move* your loads and *keep* moving them . . . extra features that add up to more service, safety, operating comfort and economy! These new Chevrolet trucks offer you more of the things that count on the job . . . more of the money-making, money-saving features you want and need on jobs that test a truck's real value. Check what Chevrolet trucks offer and see for yourself. Valve-in-head engines that squeeze more power from every drop of gas. Self-energizing brakes for extra stopping power—greater safety. Wide-base wheels for increased tire mileage. These new Chevrolet trucks even offer extra driver comfort—with new cab seats and Ventipanes. But learn all the facts now. See the new Chevrolet Advance-Design trucks at your dealer's today.

CHEVROLET DIVISION OF GENERAL MOTORS, DETROIT 2, MICHIGAN

CHEVROLET

ADVANCE-DESIGN TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—the 105-h.p. Loadmaster or the 92-h.p. Thriftmaster—to give you greater power per gallon, lower cost per load • POWER-JET CARBURETOR — for smooth, quick acceleration response • DIAPHRAGM SPRING CLUTCH—for easy-action engagement • SYNCHRO-MESH TRANSMISSIONS — for fast, smooth shifting • HYPOID REAR AXLES—for dependability and long life • NEW TORQUE-ACTION BRAKES—for light-duty models • PROVED DEPENDABLE DOUBLE-ARTICULATED BRAKES — for medium-duty models • NEW TWIN-ACTION REAR BRAKES — for heavy-duty models • NEW DUAL-SHOE PARKING BRAKE —for greater holding ability on heavy-duty models • NEW CAB SEATS—for complete riding comfort • NEW VENTIPANES — for improved cab ventilation • WIDE-BASE WHEELS—for increased tire mileage • BALL-TYPE STEERING—for easier handling • UNIT-DESIGN BODIES—for greater load protection • ADVANCE-DESIGN STYLING—for increased comfort and modern appearance.

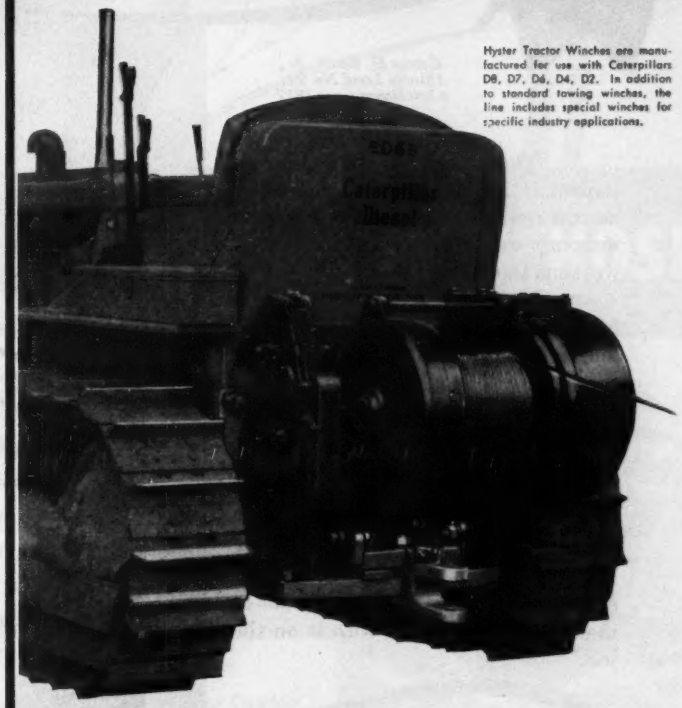
More than 40,000 satisfied owners of —

HYSTER® Tractor Winches

Hyster Towing Winches increase tractor drawbar pull by as much as 63% when utilizing the maximum line pull of the winch. They are used to —

- ✔ **MOVE** heavy equipment.
- ✔ **RESCUE** heavy trucks or pieces of equipment that are mud-bogged.
- ✔ **PULL** the tractor itself out of mud or other situations that have incapacitated the tractor.
- ✔ **INSURE** against work stoppage or down-time on any project using equipment.
- ✔ **ASSIST** in stump and land clearing operations.
- ✔ **INCREASE** production in logging operations through the use of arch-logging methods.
- ✔ **GROUND SKID** or pan skid logs.
- ✔ **YARD** logs.
- ✔ **PERFORM** innumerable lifting jobs in conjunction with crane attachments.

Hyster's complete line of tractor tools includes winches, yarders, donkeys, cranes, logging arches and sulkies®; Grid Rollers for bituminous road salvage; and Hystaway®, the 5 in 1 tool that includes dragline, clamshell, crane, shovel and backhoe.



Hyster Tractor Winches are manufactured for use with Caterpillars D8, D7, D6, D4, D2. In addition to standard towing winches, the line includes special winches for specific industry applications.

HYSTER COMPANY

2921 N. E. Clackamas, Portland 8, Oregon
1821 North Adams Street, Peoria 1, Illinois

World's Largest Manufacturer of Tractor Winches

Sold and Serviced for more than 20 years by CATERPILLAR-HYSTER dealers all over the world

A high percentage of all Caterpillar Diesel tractors are equipped with Hyster winches.

Caterpillar dealers around the globe—more than 400—sell and service Hyster towing winches for Caterpillar-built tractors.

Hyster towing winches are used in these basic work classifications: CONSTRUCTION, INDUSTRIAL, LOGGING, MINING, OIL and GAS, MILITARY, AGRICULTURE, TRANSPORTATION, GOVERNMENT.

Any Caterpillar dealer will gladly tell you about Hyster tractor winches.

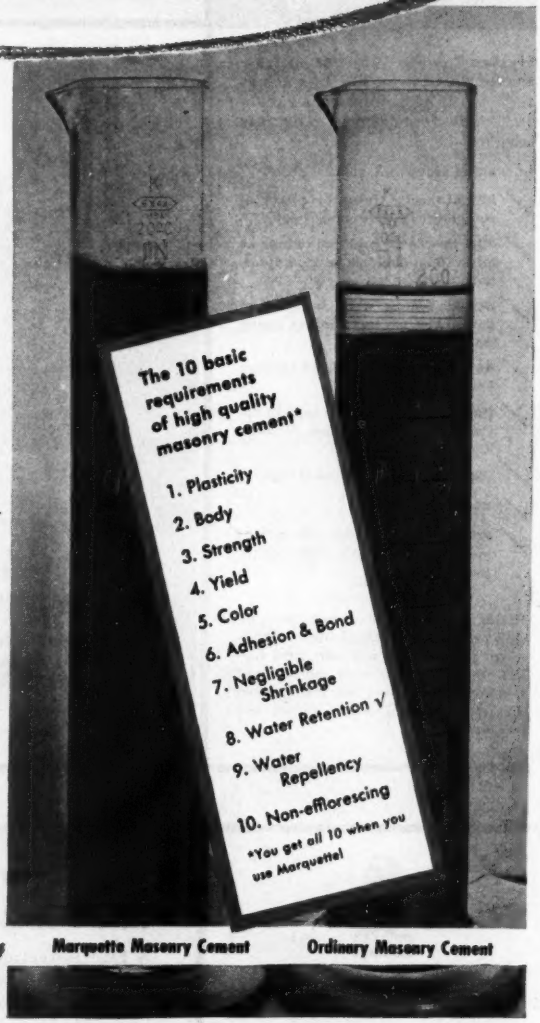
"You don't want to lose the water..."

George H. Smith, Jr.,
Illinois Local No. 21,
a bricklayer since 1917

"The water you add to masonry cement is important. If it leaves the mortar too fast, due to suction by the masonry units, it causes cracks and weakens the joint.

"Mortar made with Marquette Masonry Cement retains its moisture longer. You can see the proof of that in the picture. The glass on the left contains Marquette Masonry Cement. Notice how much more water it has retained? That means you won't have to worry about cracks and weakening because of shrinkage.

"Any way you look at it Marquette Masonry Cement makes *better* mortar. I get plenty of proof of that every day I work with it on the job."



MARQUETTE Masonry CEMENT

Marquette Cements

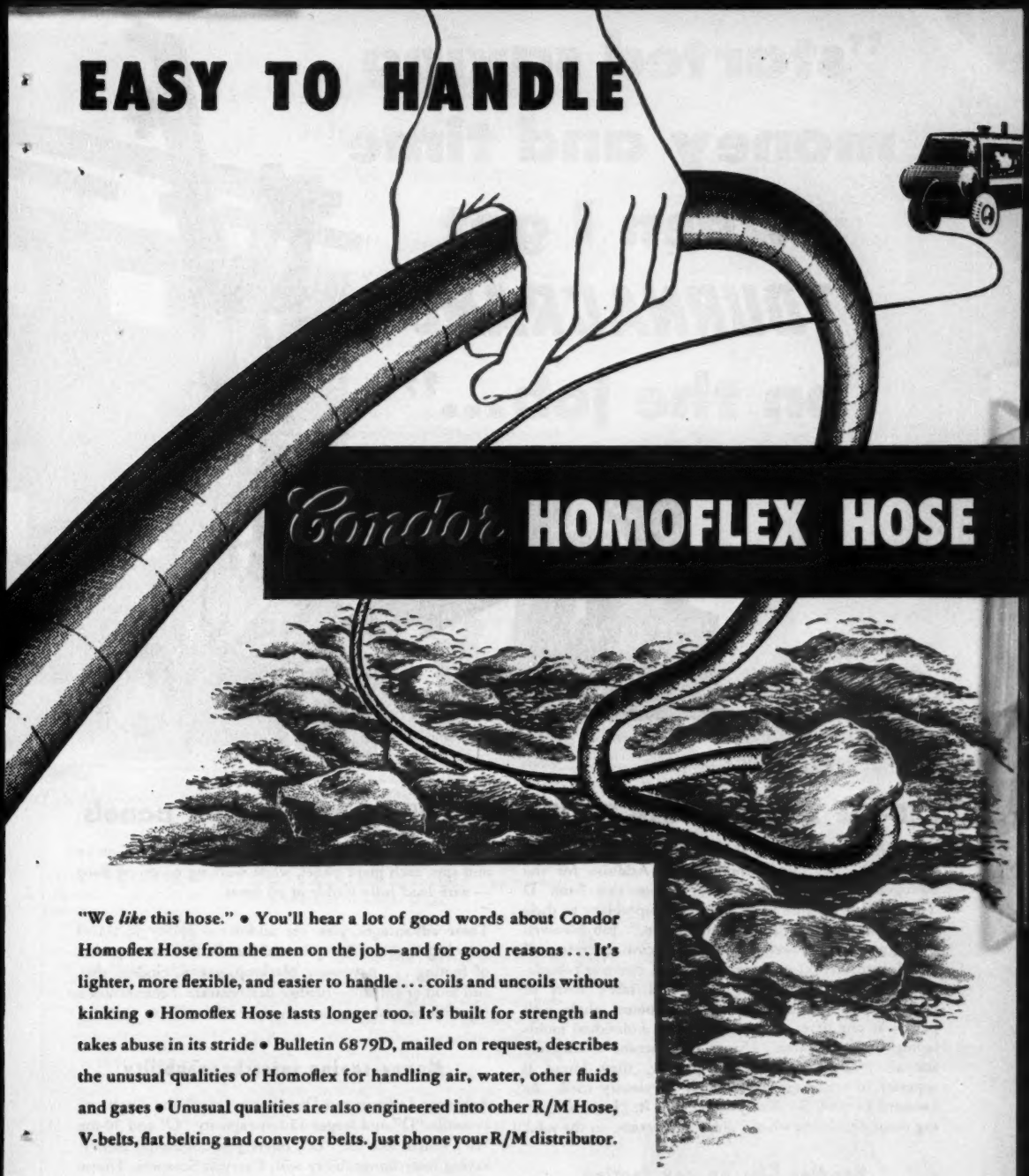
Marquette Cement Manufacturing Company

CHICAGO • ST. LOUIS • MEMPHIS • JACKSON, MISS.

PORTLAND • HIGH EARLY STRENGTH • AIR ENTRAINING • MASONRY

Any quantity of Marquette Masonry Cement will be shipped in mixed carloads with other types of Marquette Cement

EASY TO HANDLE



Condor HOMOFLEX HOSE

"We *like* this hose." • You'll hear a lot of good words about Condor Homoflex Hose from the men on the job—and for good reasons . . . It's lighter, more flexible, and easier to handle . . . coils and uncoils without kinking • Homoflex Hose lasts longer too. It's built for strength and takes abuse in its stride • Bulletin 6879D, mailed on request, describes the unusual qualities of Homoflex for handling air, water, other fluids and gases • Unusual qualities are also engineered into other R/M Hose, V-belts, flat belting and conveyor belts. Just phone your R/M distributor.

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Manufacturers of Mechanical Rubber Products • Rubber Covered Equipment • Radiator Hose • Fan Belts • Brake Linings • Brake Blocks • Clutch Facings • Packings • Asbestos Textiles • Powdered Metal Products • Abrasive and Diamond Wheels • Bowling Balls

"started saving money and time when I got *TOURNACRANE* on the job..."

BEE-CEE BUILDERS use TOURNACRANE to move giant panels

When Bee-Cee Builders, Skokie, Ill. contracted to build a new 60' x 60' factory building at Addison for the Savogran Co. of Illinois, they chose the 7-ton D Tournacrane because of its unusual adaptability to their building method, "Tilt-up Construction." Job involved lifting and setting twelve 6" thick precast concrete wall panels into vertical position on edge of concrete foundation. Bee-Cee eliminates high hand labor costs of laying walls with concrete blocks — pours whole wall panels at one time, on-the-spot, within individual molds laying on foundation. Using Tournacrane exclusively for all lifting, spotting and placing, they found it superior to other types of cranes previously used. As Leonard Borisof, Bee-Cee partner puts it, "I started saving money and time when I got Tournacrane on the job."

Handles lifts on any footing

Picture-story shows one-man Tournacrane at work — note how electric pushbutton control of all steering and lifting gives operator freedom to safely suspend, move and spot each giant panel, while working on or off floor — *with load fully visible at all times.*

These advantages, plus the additional ability to travel over highway at 28 m.p.h. and handle lifts on any kind of footing . . . pavement, blacktop, gravel, cinders, dirt, and mud or soft fill—further demonstrate Tournacrane's capacity to make money on your lifting jobs, too!

Money-saving interchangeability

Ask your LeTourneau Distributor for all the details on versatile "D" and larger 15-ton capacity "C" and 30-ton "B", which, like the "D", offers you additional money-saving interchangeability with Carryall Scrapers, Tournarockers, Tournahaulers, and other auxiliary units that put your investment dollar to work all year 'round. Call him or write TODAY.

LET

R. G. LeTOURNEAU, INC.

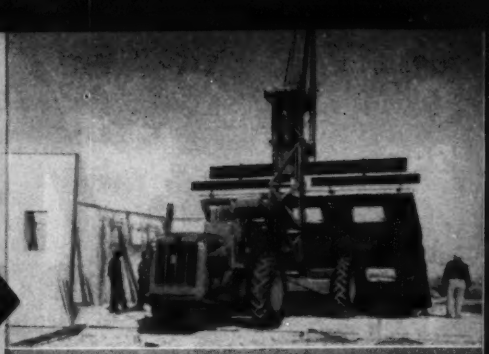
Peoria, Illinois

Here's how TOURNACRANE sets up 60′ x 60′ factory building

Lifts 19,000-lb. panels. Low center of gravity on 16′ wheel base plus rig's 23,090-lb. weight increased stability . . . enabled it to handle up to 19,000-lb. panels without outriggers. Giant panels are built of 3,500 p.s.i. concrete, 6″ thick . . . including 1½″ layer of inside-insulating vermiculite mixed with Portland Cement. Panels measure 19′6″ x 16′2″ (2-10 ton each) 19′6″ x 12′2″ (10-8 ton each).

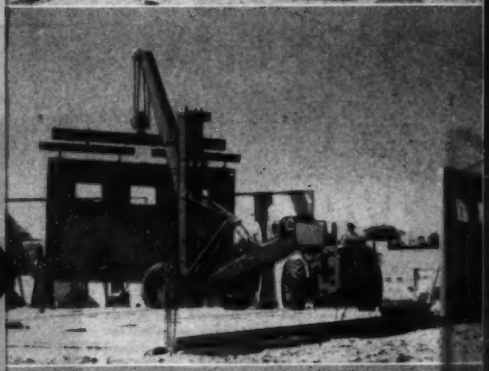
Lifts complete panels

On initial set-up, concrete is poured directly into wooden forms, laying on foundation poured previously, with openings for standard size door and windows. Prior to pouring, form oil is spread on floor which forms bottom of the mold and prevents concrete adhesion. When concrete is fully cured, precision-controlled Tournacrane with "I" beam hitch, raises panels gently . . . eliminates damage to edges or corners. Powered lift and drop maintains constant cable tension . . . assures safe, steady lifts and smooth stops.



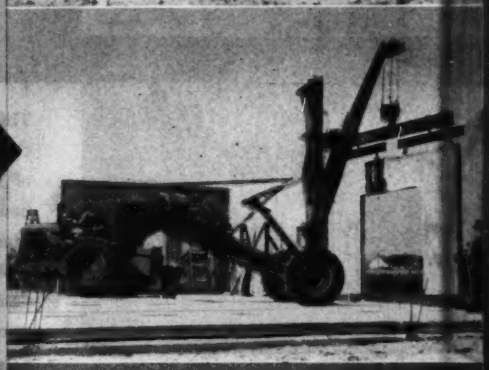
Carries panels to floor edge

Building begins to take shape as Tournacrane moves panels to correct location. Big rig is easily maneuvered forward or reverse . . . makes tight 90° turns . . . lifts 29′6″ maximum, reaches 31′ horizontally. Giant, 14.00 x 32 soft-cushion tires permit machine to ride over lumber, timbers, and forms lying on floor, without damage to tires, floor or material.



Spots panels for grouting

Power for lifting and steering operations is furnished by individual electric motors. Fingertip dashboard switches enable operator to position accurately, check alignment with wall and raise each panel while concrete grout is spread on foundation. "The electric controls on this crane let me spot the panels exactly where they're needed," was the way the operator summed it up.



Places for final finishing

Plenty of braking surface in big disc-type air brakes contributes to safe, steady load handling on pavement, blacktop, gravel, mud or soft fill. Operator has positive control of panels while it rests firmly on newly applied concrete grout, and supporting braces are applied. In final finishing, concrete columns are poured between panels to anchor wall sections and form supports for roof trusses.

Tournacrane, Tournahoist—Trademark
Carryall, Tournacrane—Trademark Reg. U.S. Pat. Off. CR-42

Get all the facts on TOURNACRANE NOW!

Mail Today!

R. G. LeTOURNEAU, Inc., Peoria, Illinois

Please send complete specifications on ☐ 7-ton Tournacrane ☐ 15-ton Tournacrane ☐ 30-ton Tournacrane. ☐ Also give price, delivery information.

NAME _____ TITLE _____

COMPANY _____

STREET _____ CITY _____ STATE _____

Type of work to be handled _____

1939

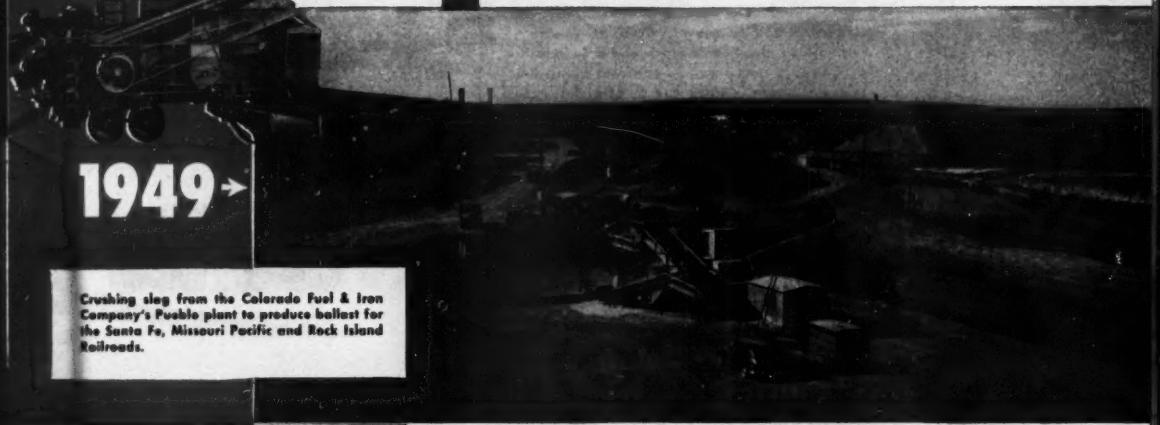
1940

1942

4 Austin-Western CRUSHING PLANTS

for Arthur & Allen of Pueblo, Colorado

1949→



Crushing slag from the Colorado Fuel & Iron Company's Pueblo plant to produce ballast for the Santa Fe, Missouri Pacific and Rock Island Railroads.

The man at the feed conveyor in the foreground is salvaging iron from the slag.

This, the fourth Austin-Western Crushing and Screening Plant purchased by Arthur & Allen over a ten-year period, has an average run of 350 tons per hour and has reached a peak output of 420 tons per hour. The finished product is, in almost all cases, 1½" minus to ⅜" plus. The percentage of crush is approximately 60.

Whatever your production requirements, an Austin-Western Plant, designed and tailor-made to meet them, will do the same sort of outstanding job for you. Let's talk it over.

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U.S.A.

Subsidiary of BALDWIN-LIMA-HAMILTON CORPORATION

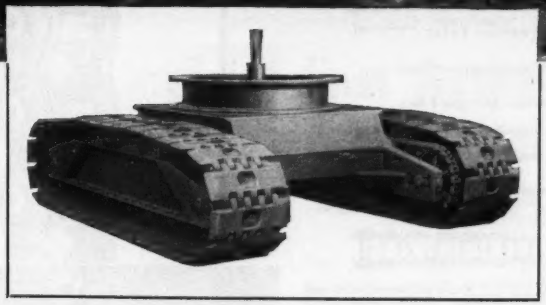
These conveyors are carrying the combined output of jaw and roll crushers.

The loading hopper is arranged to accommodate two trucks at one time.

BUILDERS FOR PROGRESS

Austin-Western

BALDWIN BLH LIMA HAMILTON



TOUGH AS A TANK!

LINK-BELT SPEEDER

All-welded steel construction means extra strength without extra weight

POUND for pound, the Link-Belt Speeder all-welded frame is stronger than other types of structures. Box section construction adds still more strength, uniting the entire base in one rugged, yet flexible structure by means of unrestricted design. Resistance to impact and twist is greater.

Deep recessing and full enclosure of mechanism, flush bottom, and high ground clearance provide maximum protection and maneuverability. Field maintenance is simple and quick. In fact, in every way, Link-Belt Speeder all-welded construction is truly "tough as a tank."

LINK-BELT SPEEDER
CORPORATION
12,506-A

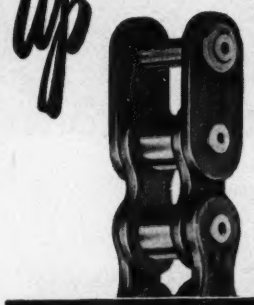
Builders of the most complete line of shovels, cranes and draglines
CEDAR RAPIDS, IOWA

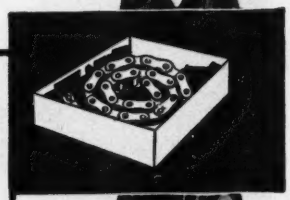
THIS ROLLER CHAIN IS "made up"

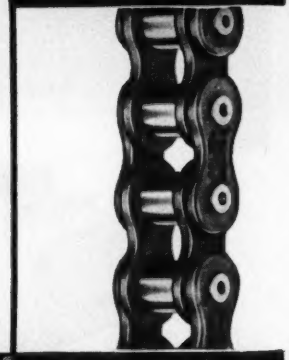
. . . NOT "CUT UP"

. . . And it's an important reason why Baldwin-Rex "BA" Assembly Riveted Roller Chain has proved such a big success everywhere it is used.

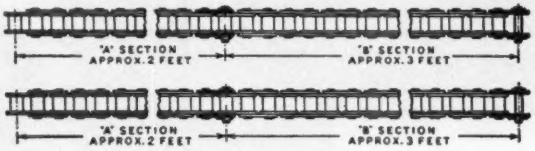
With "BA" you get any length of chain you want—when you want it. No fuss . . . no bother. Your shop can quickly and easily make up the chain to the exact length you require. Your distributors can just as quickly and easily make up replacement chain to required length. No chain is "cut," and possible damage to chain parts that might seriously weaken your strand is avoided. Here's how it's done.







Baldwin Rex "BA" Assembly Chain is shipped in boxes containing two 5-foot lengths with single pin connectors at approximately the two and five-foot marks. In addition, there are available a series of "BA" Short Units. (See below.)



To get the length you need, it's just a question of simple arithmetic:

For a 2-foot length, use section A.

For a 3-foot length, use section B.

You get 4 feet by combining two A sections.

Two B sections give you 6 feet.

7 feet is a combination of two A's and one B.

8 feet is two B's and an A.

And for less than two feet, 9 feet, or any odd length, just use a combination of the standard lengths plus the appropriate "BA" Short Units shown below.

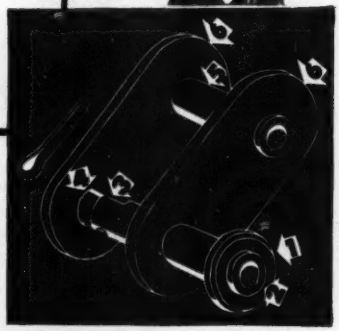
Offset Link.

Two pitch unit (single pin connector links plus roller link).

Three pitch unit (two single connector links plus roller link).

Six pitch unit (with single pin connector at end).

Ten pitch unit (with single pin connector at end).



HERE'S THE "BA" SECRET! The secret of the Baldwin-Rex "BA" Assembly is the *Single Pin* Connector. A washer (1) is spun over the head of the connector pin (2). The milled flat (3) at the cottered end of the pin fits into a special hole in the side plate (4). This combination holds the pin firmly in place, yet it's easy to remove because it's a "sliding fit" through the entire link except for the milled flat end. When the single pin connector is removed, the riveted pin at the other end of the link (5) holds the side plates (6) firmly in place.

Remember, too, that "BA" makes assembly, disassembly or repair on the job much easier . . . much faster.

Ordering Note: *If you prefer, you can order "BA" in quantity, pre-assembled in any lengths you desire.*

BALDWIN·REX
ROLLER CHAINS

Our Bulletin 50-6 has all the facts on "BA" Assembly. Write for it today or ask for it at your local Chain Belt Office. Chain Belt Company, 1664 W. Bruce Street, Milwaukee 4, Wis.

THE DEMPSTER-DIGGSTER, Type GRD, same as the one that loaded 600 tons of stone recently, has a 15 foot six inch turning radius, is 20 feet long when bucket is in traveling position, and bottom of bucket is nine feet three inches above ground when in extreme dumping position. It will dig 15 inches below grade and through a 15 foot bank.

THIS DEMPSTER-DIGGSTER, Type HL, is specially equipped for high dumping. The bottom of the bucket is 13 feet six inches above ground. It will dig through an 18 foot bank.

FOR FAST, EFFICIENT operation in difficult terrain, the Dempster-Diggster is available with crawler-type traction.

Fast Automotive Shovel Loads 600 Tons of Stone in Half a Day

CONTRACTOR REPORTS: HYDRAULIC CROWD, HOIST UNIT "FILLS LONG NEEDED PLACE IN OUR INDUSTRY"

THE DEMPSTER-DIGGSTER, a revolutionary shovel loader, recently loaded 600 tons of broken stone in the first half day of operation. This outstanding performance was reported to Dempster Brothers, Inc. by W. E. Lambert, president of Lambert Brothers, Inc., one of the nation's largest crushed stone contracting firms.

"In connection with our extensive activities in several southern states," the contractor said, "we have used various types of power shovels and front end loaders. After seeing the easy operation of the hydraulically operated Diggster in a demonstration we had made alongside of a competing loader, we placed an order with you. We installed the Diggster equipped with a yard and half stockpile bucket on one of our operations in western North Carolina.

"Our records show," he continued, "that the unit loaded approximately 600 tons of broken stone in the first half day of operation. The Diggster has been working continuously and is giving perfect satisfaction. It is a pleasure for us to so advise you because in our opinion the Diggster fills a long needed place in our industry. We welcome you to bring any interested parties to our operation to see the Diggster in action."

The tremendous speed of the Dempster-Diggster in excavation and stockpile work is accounted for, mainly, by its exclusive independent hydraulic crowd and hoist action, the hydraulic steering, and wheel-type traction, which permits truck speeds to and from jobs. The power crowd permits bucket to keep digging until loaded . . . no digging with wheels. The hydraulic steering gives the driver easy, fast, finger-tip control.

Four standard interchangeable buckets of two types are available. Digging buckets with four bottom teeth in 1 and 1¼ cubic yard (heaped) capacities; materials handling buckets in 1½ and 2 cubic yard (struck) capacities.

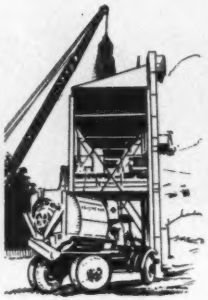
Complete information and prices may be obtained by writing the manufacturer, Dempster Brothers, Inc.

DEMPSTER DIGGSTER

DEMPSTER BROTHERS
391 SHEA BUILDING
KNOXVILLE 17, TENNESSEE

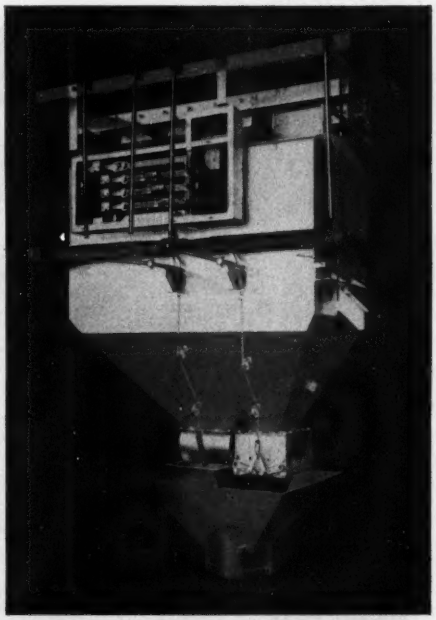
YOUR PROFITS HANG IN THE BALANCE!

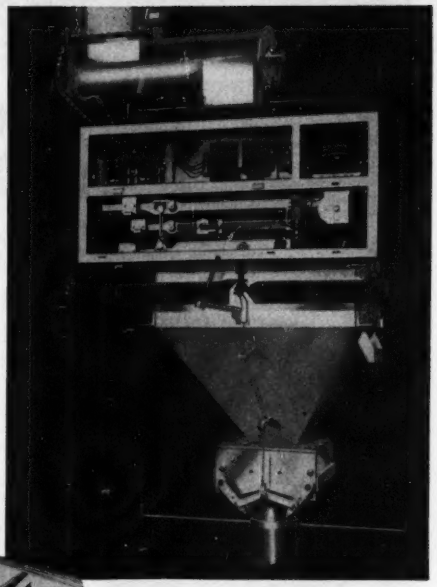
A fast, accurate balance in batching for high production is essential to a high profit operation.



And that's another vital advantage in BUTLER Weighing Batchers. Some batcher operators are, of course, better than others. The BUTLER engineer designs weighing batchers to eliminate —just as far as possible—the variations in human skill; in other words, to put the less talented operator on a par with the best. And that to you can mean a substantial extra profit.

For a performance so superior that you'll notice the difference immediately, install the BUTLER Weighing Batcher best suited for your operation. They're adaptable to any plant you have.





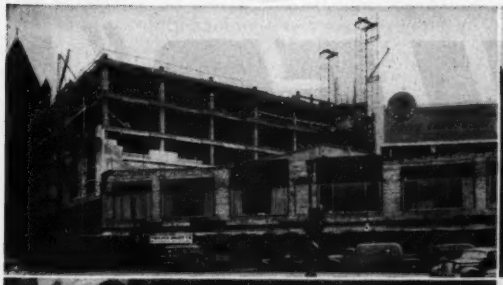
BUTLER
Roadbuilders. For complete information on practical, high production BUTLER equipment write for Bulletin 210C.
Ready Mixed Concrete, Central Mixing Plant operators. Write for Bulletin 185. Profusely illustrated. Shows many BUTLER Plants throughout the country and describes their operations.

BUTLER BIN CO.

949 BLACKSTONE AVE.

WAUKESHA, WISCONSIN

3 years— no down time



EVERY builder knows that if his hoist stops the job stops. That can mean mighty painful losses . . . in labor costs, time, and jammed-up operations. But Wm. Baumeister Construction Co. of St. Paul can tell you that hoist breakdowns are not necessary.

The job shown above—a new 6 story office building, plus refacing an older building—is a typically smooth Baumeister project. On this job and others, Baumeister has used Model 55 and Model 75 American General Purpose Hoists. In continuous use for 3 years, these hoists have *never lost a working hour for repairs.*

Take your choice of ten models, capacities from 600 lbs. to 40,000 lbs. single line pull. Your American Hoist distributor will help you get exactly what you need.

Modernize...economize...with

American Hoist
& Derrick Company
ST. PAUL 1, MINNESOTA

Mail this coupon

American Hoist & Derrick Co. 1101
St. Paul 1, Minnesota

● Please send catalog on

AMERICAN GENERAL PURPOSE HOISTS

☐ 5 to 40 H. P. ☐ 50 to 100 H. P.

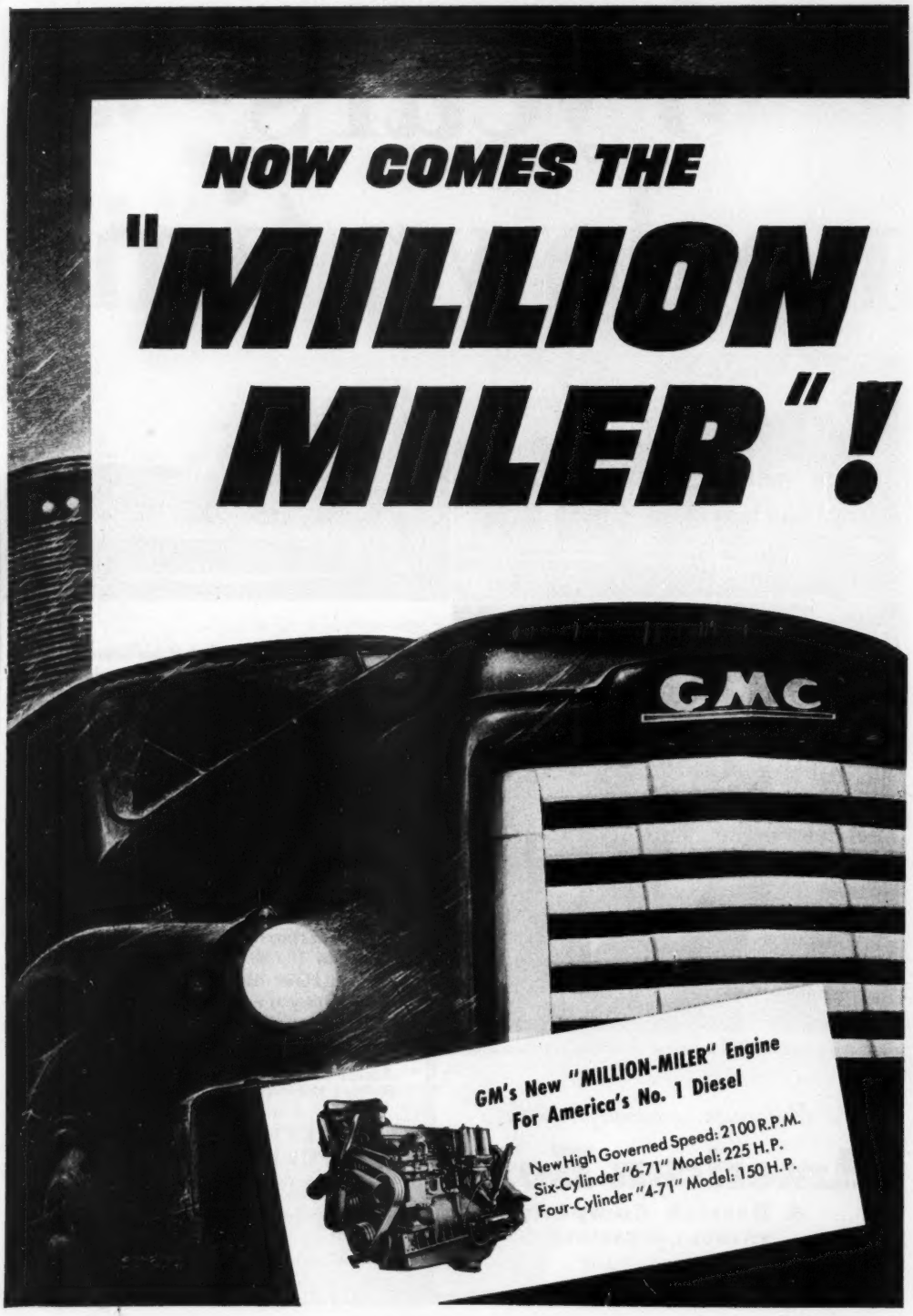
NAME_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

NOW COMES THE "MILLION MILER"!



GM's New "MILLION-MILER" Engine For America's No. 1 Diesel

New High Governed Speed: 2100 R.P.M.
Six-Cylinder "6-71" Model: 225 H.P.
Four-Cylinder "4-71" Model: 150 H.P.

A Great New Diesel That Will Pay You Dividends for Years to Come

Now the dream of every hauler comes true—a superb truck, *with an engine built to pull a million miles and more!*

For here is General Motors' "Million-Miler" Diesel—combining the famous two-cycle efficiency and lighter-weight design that have made GMC's first in heavy-duty hauling—*with new developments never before achieved in Diesel engineering:*

Automatic Fuel Modulation

First, the "Million-Miler" has a built-in brain—a revolutionary GM-engineered device called the Fuel Modulator. This absolute feed control prevents abuse, eliminates inefficiency at low engine speeds—automatically feeds this new Diesel the right measure of fuel and air, *regardless of throttle pressure.* As a result, maximum efficiency is maintained in the low engine speed range—watched over by a unit ever proportioning the perfect mix.

The result is a master Diesel that saves fuel, prevents lugging and sludging at low speeds. But that's only part of the story.

Freer Breathing at High Speeds

For next, GM engineers worked out a new timing cycle for exhaust valves in this engine—keeping the ports open for prolonged scavenging of burned gases from the cylinders.

The result is a clean-burning Diesel that takes great gulps of rich, fresh air even at the topmost speeds—insuring complete combustion, maximum power, more "go" from every ounce of fuel you use.

Here is an engine that is never fed more than it needs—and makes the most of what it gets! A clean, carbon-free Diesel that delivers 12½% more horsepower than its famous GMC forerunners of equal size and weight!

We earnestly urge you to get the facts on these new four- and six-cylinder models at your GMC dealers'. These stalwart GMC's come in a wide variety of trucks, tractors and six-wheelers—to handle any loads from 24,000 GVW up. *And every one has the sensational new GM Diesel engine—every one is powered to go a million miles and more!*

HERE'S WHAT "MILLION-MILE" ENGINEERING MEANS!

★ **AUTOMATIC FUEL MODULATION**—master-mixes air and fuel—makes every ounce count. Prevents lugging and sludging at low engine speeds.

★ **FREER-BREATHING, CLEAN-BURNING**—New 170° camshaft keeps exhaust valve ports open longer, completely scavenges chambers for maximum combustion, *refreshed power!*

★ **SUPER-STRONG CRANKSHAFT SERVICE**—Tocco-Hardened, specially processed to be unaffected by stress peaks of toughest "load-toting" range.

★ **RENEWABLE CYLINDER LINER INSERTS**—provide a solid seat for cylinder liners. Won't drive down. Add extra rigidity and life.

★ **HEAVIER-PROPORTIONED CYLINDER HEAD**—Heavier ribs and struts minimize deflections. New stud bosses with deeper grip.

★ **METAL-TO-METAL HEAD AND BLOCK**—with revolutionary individual aperture sealings. Conventional gasket eliminated.

★ **NEW INJECTOR ROCKER ARMS**—New Pallet-type design improves contact, gives longer life.

★ **CHROME-PLATED PISTON RINGS**—for increased ring and cylinder life.

★ **IMPROVED EXHAUST VALVE DESIGN**—New 30° seat-angle, with long-time Stellite facing.

★ **NEW OIL CONTROL RINGS**—with three times longer life.

And! Major parts interchangeability between four- and six-cylinder models greatly reduces parts inventory for operators of mixed GMC fleets!

GMC

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½ TO 20 TONS

GM GENERAL MOTORS

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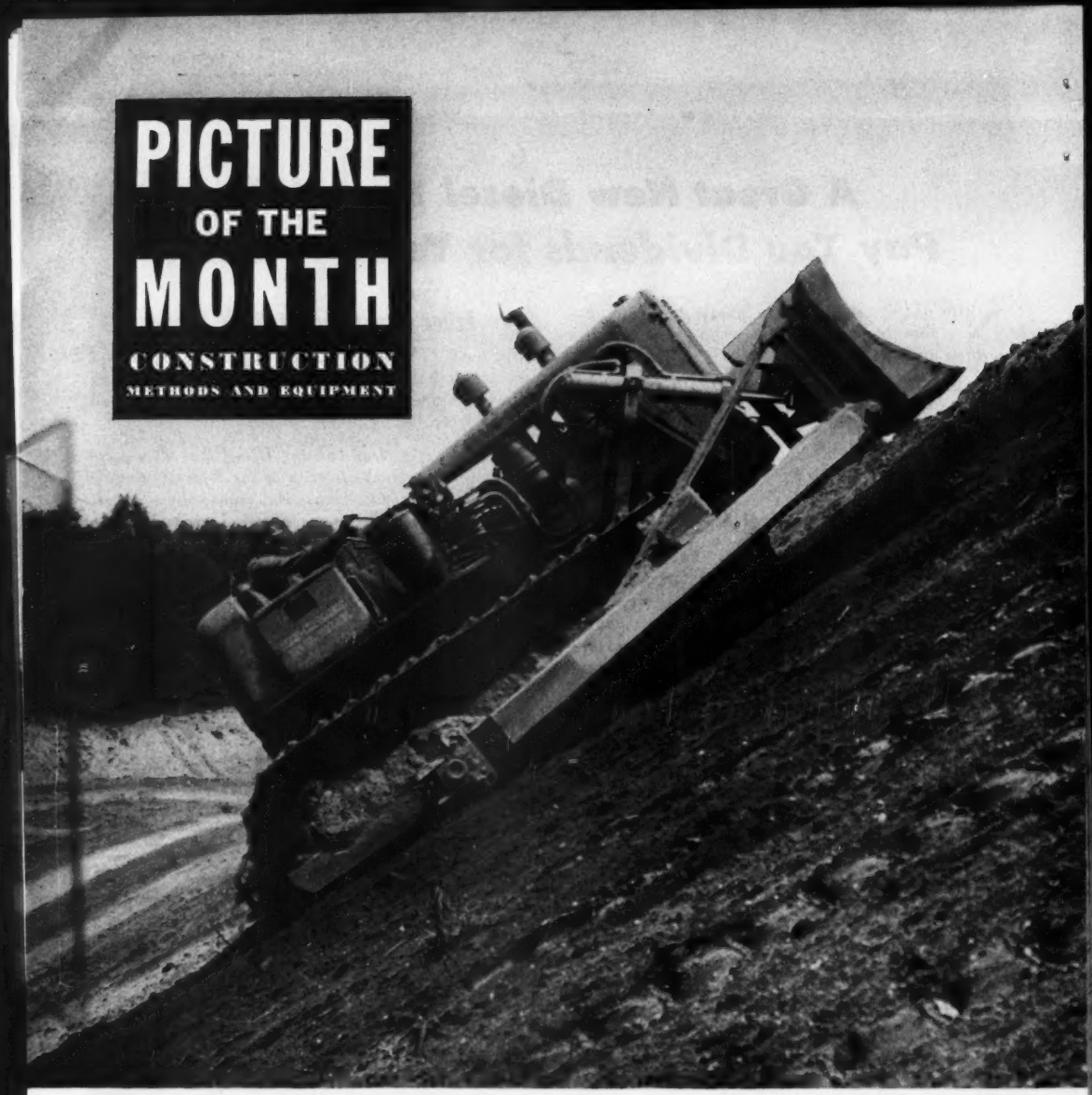
GMC Truck & Coach Division of General Motors

PICTURE OF THE MONTH

CONSTRUCTION METHODS AND EQUIPMENT



Big Crawler Tractor Takes 45-deg. Slope in Stride

RUB YOUR EYES in disbelief if you want to, but this actually happened on Contract 10 for the New Jersey Turnpike where Villa Construction Co., of Westfield, N. J., trimmed a 1:1 temporary slope by back blading with an A-C HD 19 bulldozer. It seems that they wanted to compact and trim the slope to prevent material from washing down on to the gas station site at left until more fill could be brought in for building up to 1½:1 final slopes. This operator knows his stuff. He lifts the blade high on the steep upward climb to throw the weight to back end of crawlers for maximum traction.—Jim Connolly, CONSTRUCTION METHODS & EQUIPMENT, staff photo.

A Traylor TY Reduction Crusher produces better aggregate . . . consistently

NO LIFTING OR CHURNING
Lifting and churning of material in the crushing chamber is eliminated by a Traylor TY's curved concaves and bell head. Waste fines are reduced to a minimum . . . a uniform cubical product is assured.
NO PACKING OR CHOKING
A Traylor TY's curved crushing surfaces eliminate choking and packing. Each succeeding zone in the crushing chamber has greater capacity than the zone before it. A dependable, steady supply of uniform, cubical aggregate is assured.
LOW POWER COSTS
By elimination of choking and packing . . . lifting and churning . . . power waste is reduced to a minimum. Low power cost per ton is assured.

A Traylor TY Reduction Crusher is *your* best assurance of a steady, dependable supply of uniform, cubical aggregate. Aggregate that will meet the most severe engineering requirements day after day. If you are producing stone that must meet strict specifications, put a Traylor TY Reduction Crusher on the job. Mail the coupon for free bulletin that gives complete information . . . size . . . and capacities . . . to help you select a Traylor TY to meet your needs.

Send For Complete Information

TRAYLOR ENGINEERING & MANUFACTURING CO.
389 MILL ST., ALLENTOWN, PA.

Looks like a Traylor TY Reduction Crusher is just what I need.

*Name*_____

*Company*_____

*Address*_____

SALES OFFICES: New York, N.Y.; Chicago, Ill., Los Angeles, Calif. Canadian Mfrs: Canadian Vickers, Ltd, Montreal, P.Q.

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Rotary Kilns, Coolers and Dryers · Grinding Mills
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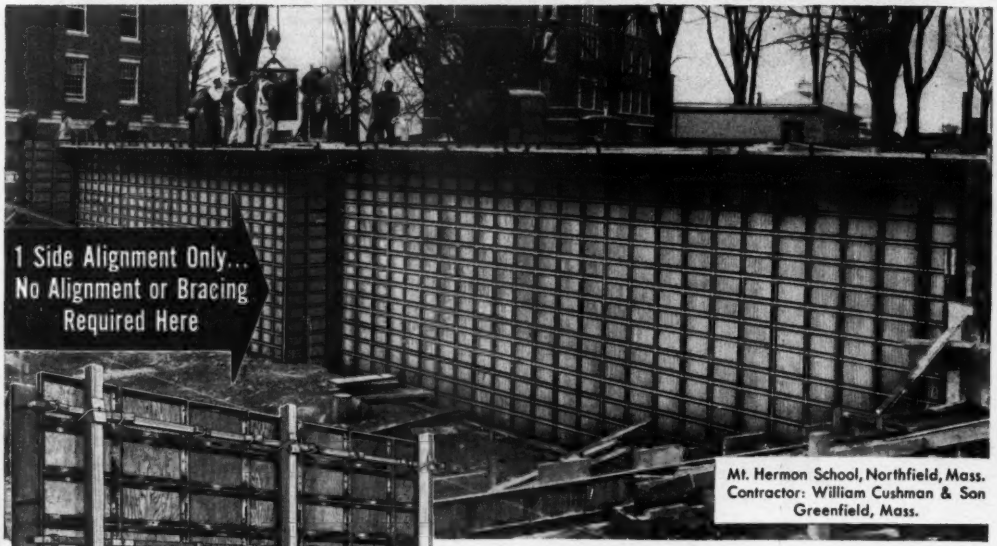
A "TRAYLOR" LEADS TO GREATER PROFITS

UNI-FORMS... "TOPS" in CONCRETE FORMING

SAVED 73% ON ALIGNMENT AND BRACING HERE!



Mt. Hermon School, Northfield, Mass.
Contractor: William Cushman & Son
Greenfield, Mass.

Let us prove how UNI-FORMS can save material and labor on *your* next job. Here's a typical example:

ALIGNMENT AND BRACING LUMBER REQUIRED TO FORM 4000Φ OF CONCRETE ON THIS JOB

METHOD	LUMBER REQ'D	AVERAGE RE-USAGE	LUMBER EXPENDED PER USE
Conventional Forms	2400 bd. ft.	6 times	400 bd. ft.
UNI-FORMS	1080 bd. ft.	10 times*	108 bd. ft.

LUMBER SAVED PER USE . . . 292 bd. ft.
% OF SAVING . . . 73%

**Standard lumber lengths always used with UNI-FORMS—no cutting—no waste.*

IMPORTANT: Less material to be handled and placed means LESS LABOR . . . even greater savings for you.
Write for complete information and your copy of the UNI-FORM Catalog.

UNI-FORMS
- A Complete concrete forming system.
- Lowest initial cost... lowest maintenance cost.
- Versatile—form any concrete.
- Automatic accuracy.

RENTED..SOLD

Universal FORM CLAMP CO.
Concrete Form Specialists Since 1912

General Offices and Factory • 1236-38 NORTH KOSTNER • CHICAGO 51, ILLINOIS • CAPITOL 7-1600

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- SPRINGFIELD, ILL., 2522 Poplar Ave.
- EUCLID, OHIO, 24901 Lakeland Blvd.
- NEW YORK, N. Y., 51 E. 42nd St.
- BALTIMORE, MD., 661 S. Monroe St.
- SWAMPSCOTT, MASS., 51 Barnstable St.
- HATO REY, PUERTO RICO, Ave. Munoz Rivera 84—Stop 27½

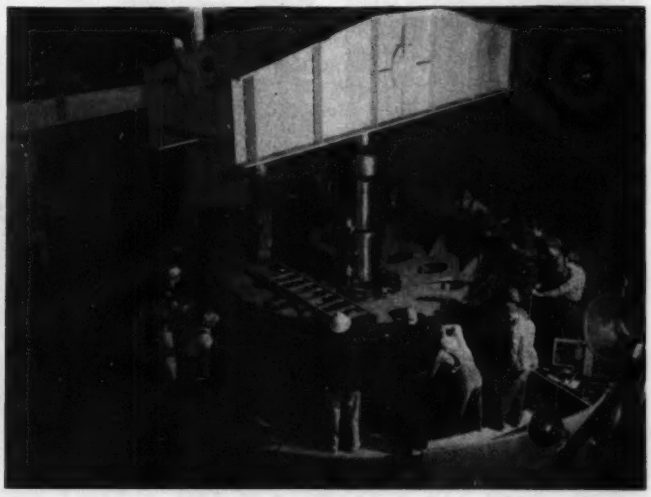
Service Wherever You Build...Coast-to-Coast

Construction News in Pictures . . .

REALLY? — Sign on crane-handled platform says "No hard hat, no ride!", so we'll assume that vagrant breeze has just flipped lid from third man's head. Anyway, safety man tried hard. This is at base of vertical 175-ft cliff at Washington Water Power Co.'s new Cabinet Gorge damsite in Pacific Northwest.

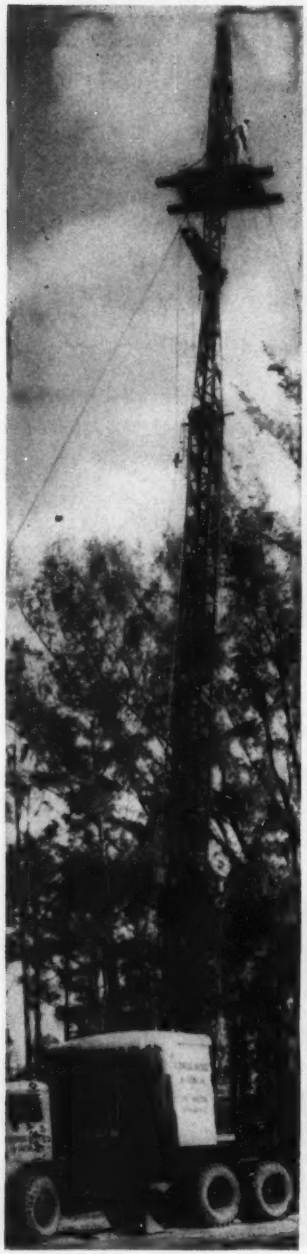
WHEW! — Hardworking crew lifts heavy length of 42-in. cast iron pipe into carriage to be rolled into under-track 465-ft tunnel on Greenville, S. C., water-line job. Arthur Pew Construction Co., Atlanta, is contractor for laying 35,500 ft of the line for $327,000.— American Cast Iron Pipe Co. photo

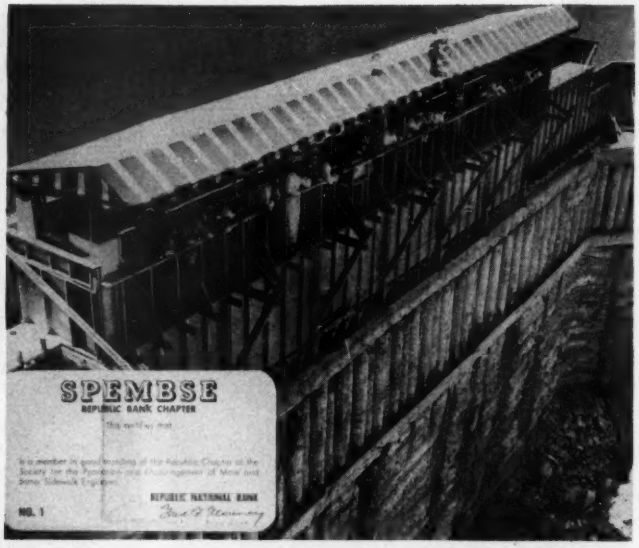
OOPS! — California Division of Highways dump-truck stands balanced on tailgate after embankment, to which it was hauling fill, gave way. Driver stepped off uninjured as truck went over. Here, from shovel dipper, chain is attached to tow machine back to road. After rescue, Mack truck went right back to work, as only damage was headlight lens broken during salvage job.



CAREFUL! — Rotor of world's largest motor — General Electric 330-ton 65,000-hp giant — is inched to place in Grand Coulee Dam pumping plant on Columbia River. Measuring 100 ft around base and 25 ft high, this motor and a twin will drive two pumps, each supplying a billion gallons daily (50 tons per sec) for Bureau of Reclamation irrigation project.

(Continued on page 44)





TEXAS STYLE — Republic National Bank, Dallas, extends Texas' traditional hospitality to sidewalk superintendents on construction of its new 40-story building. Spectators' gallery for Republic Bank Chapter of Society for Promotion and Encouragement of More and Better Sidewalk Engineers is fitted with cushioned seats, awning, soft-drink vending machines, telephone and daily progress reports. Contractor is J. W. Bateson Co., Inc.

TV STAR — Florida Bridge & Iron Co., Hialeah, is on the air: their 20-ton Lorain Moto-Crane with 70-ft boom and 30-ft jib suspends a platform holding TV dish antenna and crew 82 ft in air during broadcast of Coral Gables Methodist Church services. Miami's Station WTVJ needed line-of-sight clearance to transmitter, so used crane to save expense of building special tower.

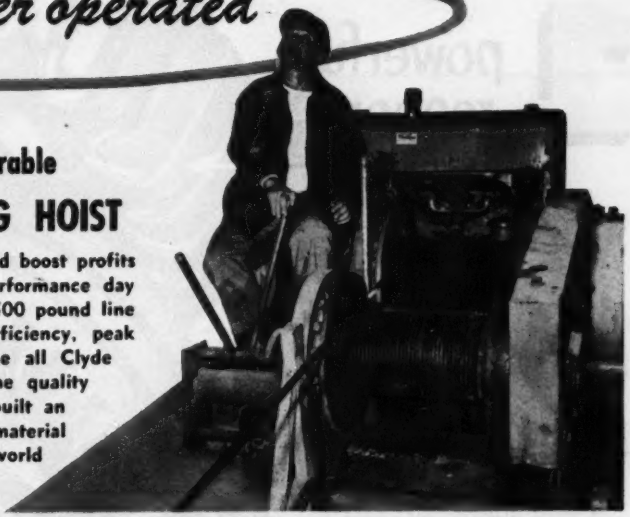
SPECIAL DELIVERY — John K. Ruff Co., Baltimore, contractor for $4,000,000 apartment there, delivers concrete direct from transit-mix trucks to centrally located hoist that takes it to 14 floors. A Barber-Greene portable conveyor, minus its regular two-wheel truck, makes the special delivery, spanning 40 ft from point of closest possible approach of transit mixers.

"... this is the finest hoist I ever operated"

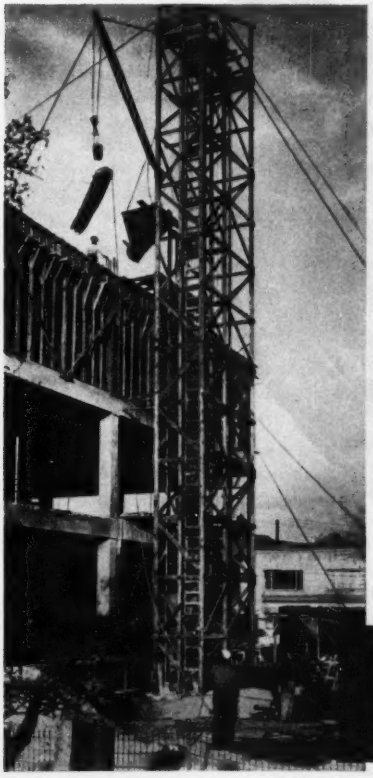
It's another dependable, durable

CLYDE BALL BEARING HOIST

A Clyde hoist will cut job costs and boost profits by delivering smooth, powerful performance day after day—job after job. Clyde 5,500 pound line pull hoists combine maximum efficiency, peak power and long service life. Like all Clyde equipment, this model provides the quality design and construction that has built an outstanding reputation for Clyde material handling equipment all over the world



This is the Clyde hoist that prompted the operator to call it "the finest I've ever operated." Shown in use on a store and office building job in Washington, D. C.



HERE'S *fatigue-free* OPERATION

When you combine these important advantages in a modern hoist design you're bound to get easier operation . . . dependable, low-cost performance. All steel, electrically welded frame and side stands for strength and rigidity. Light weight for portability. Thrust is full ball bearing screw and yoke type, easy to engage and with perfect load control. Friction is a durable, single cone with asbestos lining. Controls banked to operator's easy reach.

Heavy-duty, one piece brake bands are foot-lever actuated. Chain drive runs in a bath of oil, easy adjustments. All running shafts turn on ball bearings for maximum power and lowest fuel consumption. Available in 1, 2, or 3 drum sizes with line pulls to 5, 500 pounds.

WRITE for free folder and complete specifications on cost-cutting Clyde Frame-4 hoist.

CLYDE

CLYDE IRON WORKS Inc.

DULUTH MINNESOTA

Hoists • Derricks • Whirlers • Builditt Towers • Cat Pullers • Handi-Cranes • Rollers •

1 powerful reason

2 powerful reasons

3 powerful reasons

HARD ROCK LUG
Super-tough champ for all kinds of rock work

HARD ROCK RIB
Companion tire for front wheels in rock work

SURE-GRIP
Excellent for drive-wheel traction on graders and pans

WHY—

Again in 1951,

more tons are hauled

on Goodyear tires than on any other kind!

GOODYEAR

Sure-Grip—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

Volume 33
Number 9

CONSTRUCTION METHODS AND EQUIPMENT

SEPTEMBER
1951

Harold W. Richardson, Editor

Valley Authority Wolves are Howling

CONTRACTORS have a big stake in the controversy, sparked by the recent Kansas City disaster, now raging over just how to control floods and to develop the water resources in our great river valleys. Advocates of Valley Authorities are again on the prowl. Taking advantage of the national attention called to the Kansas and Missouri area, they are again proposing a Missouri Valley Authority as an entering wedge into their nation-wide plan for socializing every major river basin.

If these Valley Authorities are ever established, that's the end of contracting for flood control, irrigation, reclamation, navigation and water development projects in this country. There is no place for private enterprise, especially contracting, in the Valley Authority scheme of operation. Their proponents prefer to do their own construction, and everything else, for that matter.

Everybody is trying to get into the act right now—not only the old Valley Authority bloc in Congress, but a flock of editorial writers and all-wise columnists, most of whom never saw the Missouri Valley, much less understand it. Everybody, that is, except the vast majority of people living in the basin. We're writing this from the heart of the Missouri Valley, through which we've been traveling for a week.

There seems to be a big howl for a "plan", for more studies, more surveys of the basin. Even some Congressmen are proposing "an impartial survey by a board of nine members." We've got a plan now, well along in its development, based on extensive surveys and studies. It's the Pick-Sloan plan for the Missouri Basin, calling for 108 dams, all but 5 on tributaries to the main river. It is the result of independent studies, directed by Congress, made by the Bureau of Reclamation and the Corps of Engineers.

The resulting reports were so startlingly similar that their few differences were reconciled in a joint meeting of the two agencies late in 1944. And now the joint plan is well into the construction stage—being built by contractors, too, under competitive bidding. Its progress is limited only by the rate of appropriations.

What more could a Missouri Valley Authority do? It would have to take the Pick-Sloan plan or start out all over again—and probably arrive at about the same conclusions. Some people are yelling for a multitude of small dams, instead of both large and small reservoirs as called for in the Pick-Sloan plan. They overlook the fact that flood storage in small reservoirs inundates from 3 to 10 times as much as does the same reservoir capacity in larger reservoirs. Out here the tributary valleys are the most valuable and productive land. If they were filled with small reservoirs, there would be nothing left for them to protect.

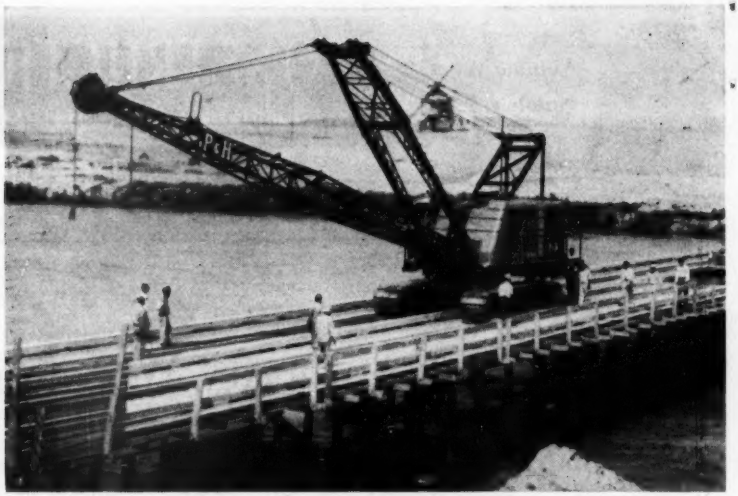
The answer to problems in the Missouri Basin is certainly not a Missouri Valley Authority. It seems to us that it lies in the faster prosecution and fuller development of the Pick-Sloan plan. Plus, for good measure, additional conservation at the grass roots in reforestation, erosion control, and contour plowing.

Contractors, wherever they may live and wherever they may operate, should be concerned over this renewed threat of Valley Authorities. They not only threaten your business, but they are another big chip off our American system of private enterprise.

Rich

FALCON DAM

...Two Jobs in One



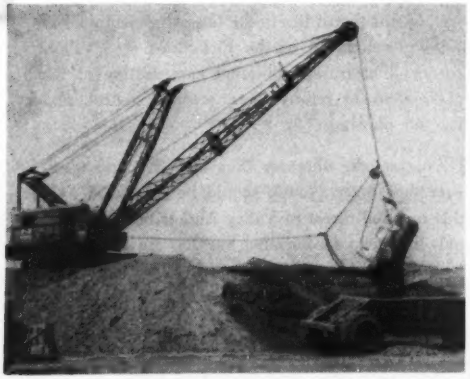
CONTRACTOR'S PILE TRESTLE across Rio Grande is all that ties Mexican and American sections of Falcon Dam together at present.

HALF TEX, HALF MEX—that's Falcon Dam way down on the Rio Grande 75 mi below Laredo, Tex. Here is the greatest of all international projects built jointly by the U. S. and Mexican governments for irrigation and power development in the lower valley.

Here is a big dam, split through the center by the International Boundary—each half being built by a separate (yet the same) corporation under different names. On one side of the river it's Falcon Dam Constructors — Amis Construction Co., Massman Construction Co., C. F. Lytle Co., Foley Bros. Inc., Edward Peterson Co., San Ore Construction Co. and Tellepsen Construction Co. On the other side it's the same firms banded together under the title of Constructora Intercontinental, S. A. The two halves were bid separately—one outfit got both jobs.

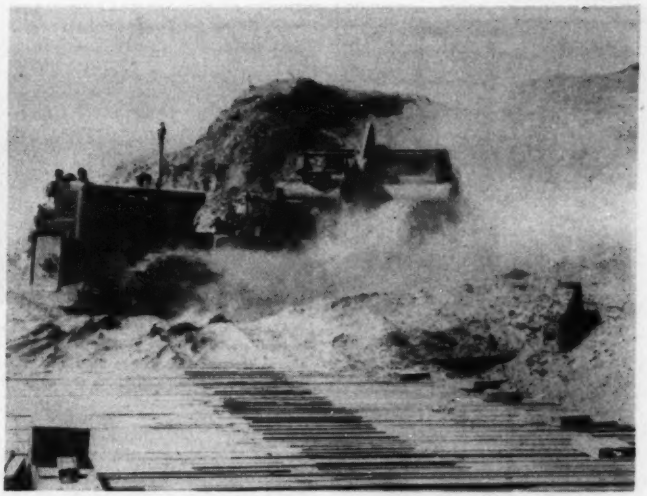
The project is being handled as two separate jobs under one general management. All you contractors who are chafing at the paper work entailed in building a federal project, just calm down. On Falcon Dam duplicates of all reports, all payrolls, requisitions, and everything else, must be made in English and in Spanish to satisfy the two-country representatives of the International Boundary and Water Commission (called IBWC from here on out). And the contractors are paid off in pesos for all work done on the Mexican side.

Falcon Dam is being built under the Water Treaty of 1944, which divides the costs between the two countries. It is a combined irriga-



BACKBONE of the earthmoving fleet are five big P&H draglines and shovels loading into Euclid bottom dump wagons. At left is a 1055 dragline with a 5-yd bucket. Spotting the bucket at the end of an 80-ft boom is no simple task, but the Mexican operators have become experts in handling big rigs. Busily loading, at right, is a 1400 diesel-electric shovel with a 5½-yd bucket.—Harnischfeger Photos

Here is a big P&H 1055 dragline walking across bridge from Texas into Mexico. Dam, requiring 18 million yd of fill, stretches 5½-mi.



EXTREME DUSTY CONDITIONS are hard on equipment building haul roads. Here is a Caterpillar scraper unit plowing through dust of its own making near Mexican end of bridge over Rio Grande. Mexicans operate equipment on their side.—Caterpillar Tractor Photo

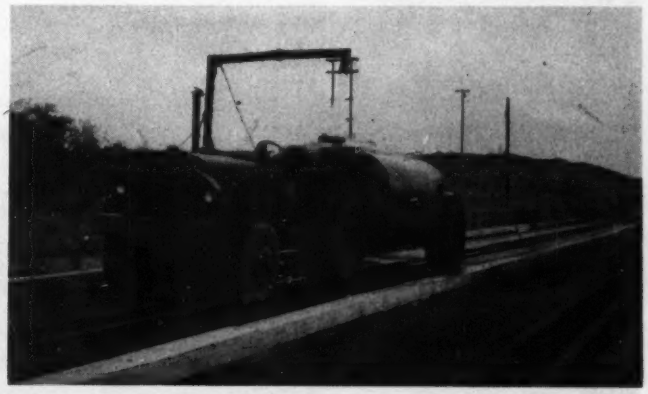
tion, flood control, power and recreation project. The dam primarily is earth fill 26,294 ft long (that's 5½ mi), 150 ft high, with a central concrete spillway section and two power houses located on opposite sides of the Rio Grande.

Quantities include 18,700,000 cu yd earth and rock fill; 420,000 cu yd riprap, 261,000 cu yd concrete, and 17,500 tons of reinforcing and structural steel. The long earth fill runs 10,133 ft on the U. S. side, and 16,161 ft on the Mexican side.

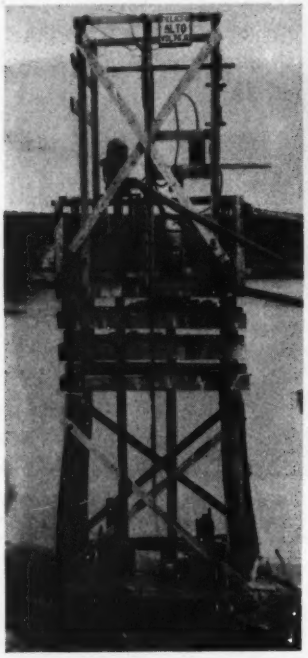
Sensibly IBWC set up an International Zone (completely fenced in) encompassing the entire dam area on both sides of the river. Within this zone, equipment, men and materials can move freely from one country to the other. Yet there are certain restrictions to be observed: On the Mexican side all the labor force, except for a few top supervisory personnel, must be Mexican. On the U. S. side, all labor must be American.

Some Compromises

These are theoretical requirements. Actually, to provide an even break in the labor forces between the two countries, some compromises are in effect. For example, the spillway is all on the U. S. side, so part of the excavation is done with Mexican labor. All concrete aggregates are coming from the Mexican side, so the Mexicans produce the aggregates, but Americans mix and place the concrete, includ-



KEY TO FAST HAUL ROADS from borrowpits to fill is constant maintenance with Caterpillar 12-motor graders (top), plus regular sprinkling with Euclid water wagon filled by pump at river bridge (bottom). Earthmoving is well under way on Mexico side.



WATERING SYSTEM for pre-soaking borrowpits to bring material up to optimum moisture content starts with pair of Johnston 6-in. deep well pumps (left) at river intake. Pumps discharge through 8-in. line to pipe grid at borrowpits. Sprinkler heads (above) spray water evenly over wide area. Pits are soaked for days, sometimes weeks, ahead of excavation.

ing that for the Mexican powerhouse.

Thus it can be seen that running the job means maintaining a delicate balance between Mexican and American labor. Yet the equipment and plant items were set up as integral units for the entire job. Therefore, training of Mexican operators to run the equipment on their side of the river became the chief problem. To the great credit of the Mexicans—and their American supervisors—they are proving to be excellent operators of all kinds of equipment. To be sure, some have come in from recent big Mexican projects, but most of them have been trained on the job.

From a construction standpoint, the job isn't too difficult—it's just one whale of a big earthmoving project, plus a lot of concrete, being built in a rather isolated part of the country 25 mi from the nearest railhead at Rio Grande City, Tex. Biggest part of the job was getting the two organizations set up on opposite sides of the river, yet coordinating and integrating operations for maximum progress and efficiency.

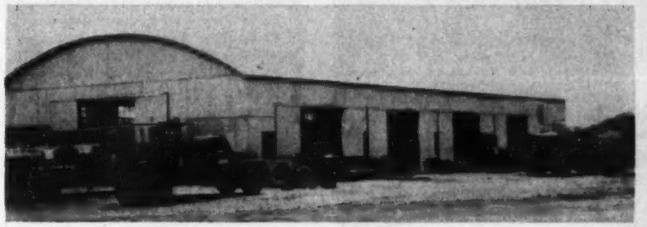
Construction started early last January. Because only about one-fifth of the embankment (in volume) is on the American side, the contractors decided to concentrate on this part of the dam first. This end of the fill was virtually completed by June 1. Meanwhile some heavy equipment was sent across the river to open up borrowpits, and gravel pit, to build haul roads and to get the core trench started. All this work proved to be good training for the Mexican operators.

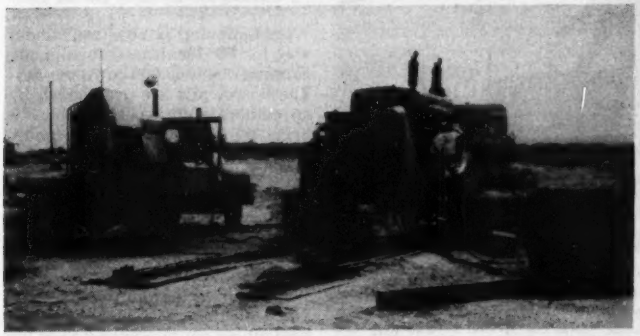
Eventually a double-lane, pile-trestle and timber-deck bridge was built across the river just below the dam. Until this bridge was complete, quite a bit of equipment was moved to the Mexican side by building a fill part way across the river with draglines. Then with the machines parked at midstream, the fill was cut loose from the American shore and built up on the Mexican shore to complete the move.

(Continued on page 52)

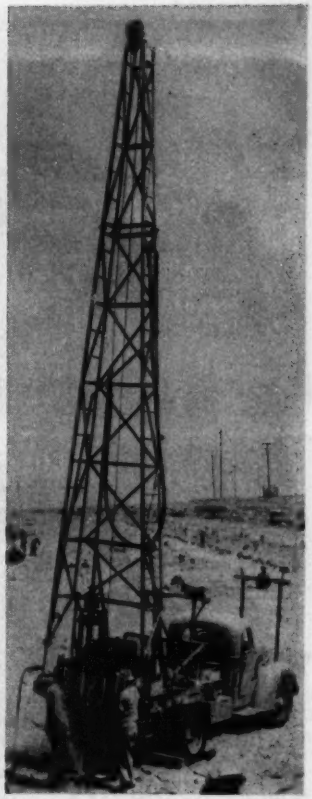
GRAVEL IS SPREAD on upstream slope of finished American embankment by Caterpillar bulldozer preparatory to placing riprap. Top of fill will carry a new international highway. Long earth fill runs 10,133 ft on the U. S. side, and 16,161 ft on the Mexican side.

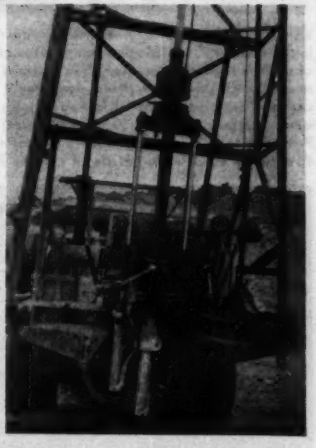
SHOTS LIKE THIS follow blast-hole drilling with the Joy machine. Large areas are blasted quickly. Rock in spillway area is drilled with wagon drills.—Marcus J. Clark Photo



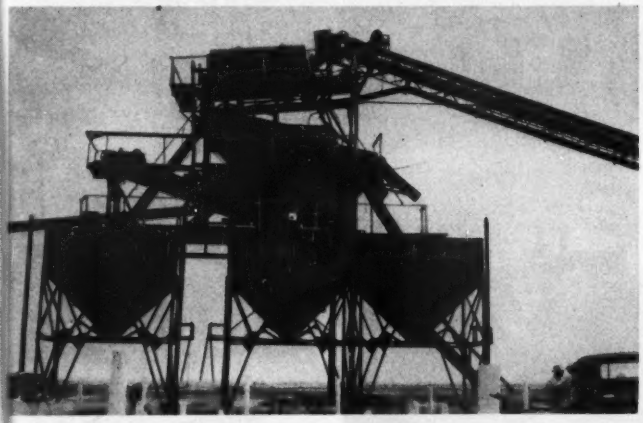


EXCELLENT EQUIPMENT MAINTENANCE and repair facilities on job keep rigs rolling on this isolated project. Big shop on Texas side (top) is duplicated on Mexican side. Good weather permits tearing down tractor for repairs out in open (center). Job-designed service trucks (bottom) take care of big machines scattered over wide area with little delay.





HOLES FOR SHOOTING ROCK in tailrace channels are put down in fast time with this Joy 37 blast hole drill (top) mounted on a truck. Rig drills 4½-in. holes, from 12 to 23 ft deep on 12x12-ft pattern at rate of 900 ft per 10-hr shift. Portable compressor alongside handy drill furnishes air for blowing out holes.—Photo by Marcus J. Clark



SAND AND GRAVEL for more than one-quarter million cu yd of concrete will be processed in this efficient all-electric plant on Mexican ground. From a 24-in. Pioneer apron feeder (out of sight to right of upper view), raw material goes by 30-in. belt to 3-deck 4x12 Cedarapids screen, which wastes everything more than 3 in. size, scalps out ⅜- and 3/16-in. sizes, and can send additional material to Rogers roll crusher for more 3/16-in. size (all in right top view). Material goes via 30-in. belt to final processing plant (bottom view) consisting of Pioneer 6x16-ft revolving scrubber; Pioneer tandem 3-deck screens, 4x8 and 4x12 ft; twin-screw Eagle classifier to get rid of extreme fines, and three 45-yd bins, one with partition.

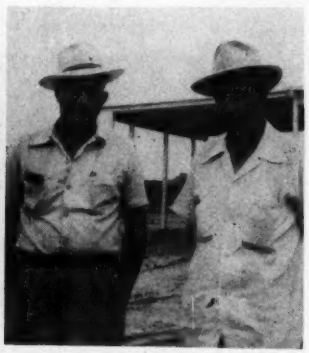
Operations are backed up by $3¼ million worth of equipment. Major items are:

- 5 P&H 1055 draglines, 5 yd Yaun buckets
- 1 P&H 1055 crane, 120 ft boom
- 1 P&H 1400 diesel-electric shovel, 5½ yd Esco bucket
- 4 Northwest 2½-yd shovels
- 1 Bucyrus-Erie 54B dragline
- 1 Koehring 1½-yd shovel
- 2 Lorain motor cranes
- 24 Caterpillar D8 tractors
- 5 International TD24 tractors
- 4 Caterpillar D7 tractors
- 3 Allis-Chalmers HO-19 tractors
- 5 Caterpillar 12 motor graders
- 4 Caterpillar 80 scrapers
- 4 Wooldridge TCY scrapers
- 36 Euclid 15-yd bottom-dump wagons
- 6 Euclid 24-yd bottom-dump wagons
- 5 Euclid 10-yd end-dump trucks
- 5 Water wagons
- 70 Ford, Chevrolet and International trucks, ½ to 5 ton
- 3 Rome disks
- 17 Light plants
- 5 Tamping rollers
- 18 Pumps
- 4 Air compressors
- 10 Autos
- 1 Pioneer gravel plant
- 1 Koehring-Johnson batch and mix plant

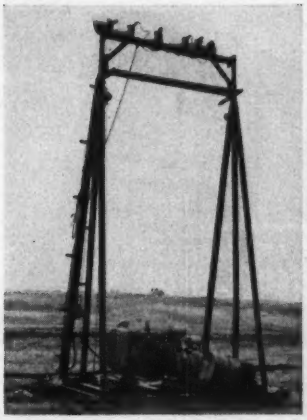
Earthmoving is now well under way for the Mexican embankment, running about 60,000 cu yd per day. The borrowpits are pre-soaked by an elaborate sprinkling system to bring the material up to optimum moisture content, so very little sprinkling of the fill is necessary. Two 6-in. Johnston deepwell pumps, set up on the river bank, supply water to the sprinkler heads through a grid of 8-in. pipes covering the borrowpits.

The contractors built their combined headquarters and American field offices on the Texas side of the river, and also established full field offices on the Mexican side. Com-

MEXICAN ENGINEERS employed by IBWC have become proficient in taking soil samples from fill to check compaction and moisture content. Our willing neighbors are good students, have proven themselves to be good operators of all kinds of equipment.



TWO TOP MEN on the job for contractors are Arthur Church (left), executive assistant, and Phil Royer, works project manager.



SEVENTEEN PORTABLE light plants on skids keep job going at night; they are supplemented by floodlight batteries on poles.

FINISHING TOUCHES are put to concrete plant by P&H 1055 crane setting final section of main conveyor to batch plant. Plant houses Johnson batchers and three Koehring 2-yd mixers. Structure at right is ice plant for cooling water used to mix concrete.

plete shops also were built on both sides. Goodyear Tire & Rubber Co. has set up complete tire repair facilities in Mexico to take care of the scores of big tires right on the job. No housing, except a few units for key personnel, was built on the American side. The American workmen live in trailer camps and in limited housing facilities in nearby Texas towns A dormitory and mess hall have been built for the Mexican workers.

The American representatives of IBWC have their own houses and offices on the Texas side. The Mexicans are building a whole new modern town for 2,000 population, Nuevo Guerrero, downstream from the dam to replace an old village that will be drowned out by the reservoir. Here the Mexican IBWC representatives will have their housing and offices, and the town will also be headquarters for the Mexican Recursos Hidraulicos.

Because of the large area covered by the project, about 6 mi from one end to the other, the contractors found it advantageous to set up a two-way General Electric radio system that blankets the job. A central transmitter station serves the offices, shops and nine transporation units used by key personnel. The radio system is on the same frequency, and uses the same call signals, as Lytle & Green's Alaska project. Under ideal transmitting conditions calls from one job are heard by the other, resulting in much confusion.

For the International Boundary and Water Commission, L. M. Lawson and David Herrera Jordan are American and Mexican Commissioners, respectively. Veteran dam builder Richard B. Ward has been borrowed from the U. S. Bureau of Reclamation as project engineer for IBWC, and R. B. Collons is field engineer. Corresponding Mexican engineers are Oscar Gonzales Lugo and Carlos Malina Rodriquez.

For the contractors, Forrest Parrott, of C. F. Lytle Co., is chairman of the operating committee made up of one representative of each participating firm. Philip C. Royer is project manager and Arthur Church is executive assistant. Other supervisory personnel include: Perry Gardner, project engineer; Harry Zachau, concrete superintendent; Merle Orten, equipment superintendent; Ed Marx, electrical superintendent; Jim Brodt, office engineer; Fred Kenney, office manager; Ed Davis and George Whittet, shift superintendents; and Roy Mauser, gravel plant superintendent. A. H. (Doc) Leal is general superintendent on the Mexican side, and Ernie Hall is administrative advisor for the Mexican group.

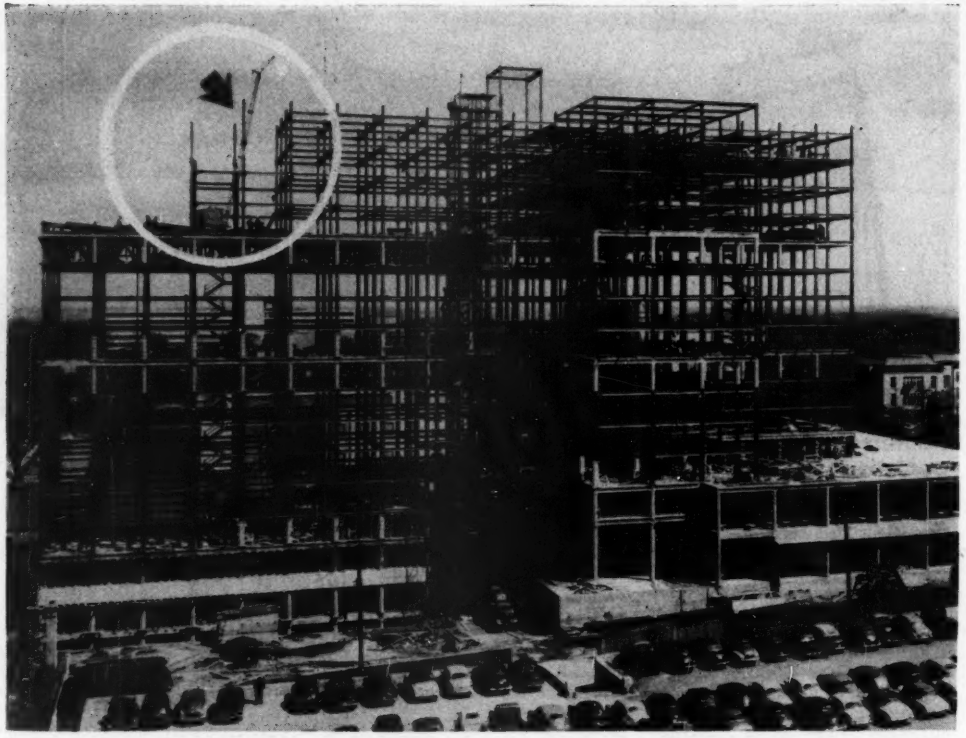
Fatal Blast Points Up Need for Persistent Safety Program

ONCE AGAIN construction work has made a tragic headline: "Blast Kills Nine at Dam." And this same premature firing seriously injured nine more.

What caused the blast? First reports from the scene stated that it had just started to rain when a bolt of lightning struck one side of the rocky dam-site canyon and jumped 1,700 ft across to the other, firing loaded holes in both walls. Drillers, powdermen and equipment operators were among those killed.

What caused the tragedy? Work was continued during the storm's approach, and a coroner's jury found that "negligence caused by insufficient warning devices and safety measures" preceded the fatal explosion.

Whatever the facts in this instance, it is still true that eternal vigilance is necessary to protect men from hazards—both natural and man-made—on construction jobs. Only last month, in an article on safe blasting techniques (page 105), we again warned of lightning dangers. Powder companies have long recommended removal of men from loaded areas during approach and progress of storms. If you don't learn a lesson from this latest accident, if you don't keep your men safe, you're likely to find your pocketbook stung even if your conscience isn't.



WAY UP THERE in upper left corner is a Schield Bantam crane on skids working from 11th story of Howell House Apartments in Atlanta, erecting steel through the 15th floor. Rig had previously worked from 7th floor, setting all steel through 11th, then was jumped by four hand winches to new level. Later it was hoisted to 15th floor to finish up steel erection.

Crane on Skids Rises With Building To Erect Steel on 17-Story Apartment

(See Front Cover)

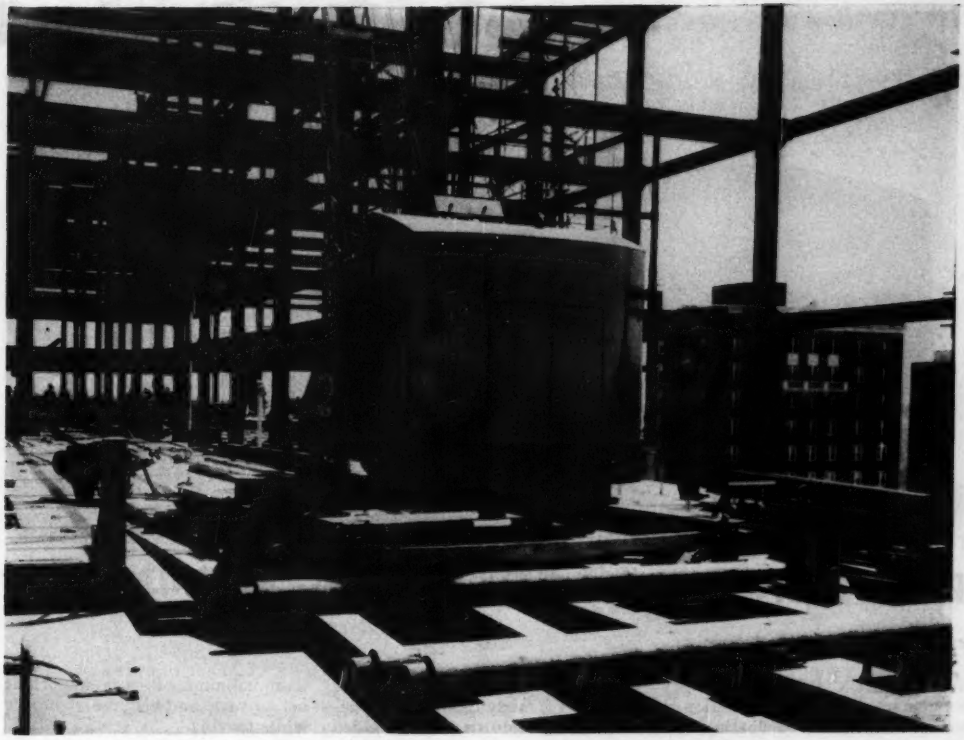
AFTER STEEL for the first 7 floors of the new 17-story Howell House Apartment Hotel in Atlanta had been erected, Atlanta Steel Erectors, Inc., hoisted a Schield Bantam crane (minus undercarriage) to the 7th floor, and jumped it later to the 11th and 15th floors to set the remainder of the steel. Top tonnage set by this rig in one 8-hr day was 91 tons; the daily average was 50 tons. The contractor reported erection progress on the upper floor steel with the crane was 65% faster than it would have been with guy derricks or gin poles.

Steel for the first 7 floors was erected by a Lorain 414 Motocrane working from the ground. Then the concrete slab for the 7th floor was poured, far in advance of other floor construction, to serve as a base for the Schield Bantam crane operations. This rig was hoisted, without boom, to the 7th floor by the Lorain crane. A 50-ft boom with an 8-ft jib was added after the machine had been hoisted to place.

Crane Operates on Skids

The crane was mounted on a skid frame of two 6-in. I-beams 10 ft long across two 8-in. beams 16 ft long. The latter rested on 7-in. rollers, which, in turn, rolled over timber stringers on the concrete floor. When the rig was working, the skid frame was lashed fast to column bases by wire rope and turnbuckles. It was moved around over the rollers by the machine's own power by the drag cable reeved up through snatch blocks hooked to the columns.

Working from the 7th floor level the crane erected all steel through the 11th floor. Steel was landed on the 7th floor by the Lorain rig, and then picked up and erected by the Schield Bantam. Rated at 5 tons capacity, this machine easily set 2,500-lb columns at 37-ft rad. The upper crane set the steel just



FOR SKIDDING around floor, crane is mounted on steel skid frame moving over wood rollers on timber stringers. When crane is erecting steel, skid frame is lashed to columns. It is moved by its own drag cable through snatch blocks attached to columns. Rig operates over concrete floor slabs poured at 7th, 11th and 15th floors as soon as steel reaches these levels.

about as fast as the lower machine could hoist it from ground level, and the synchronized operations of the two rigs was a joy to behold.

Upon completion of steel erection through the 11th floor, that floor slab was poured prior to hoisting the crane to the new level. An opening was left in the steel framing and in the slab large enough to permit the crane to be lifted, with boom removed, by four hand crabs. The riggers contemplated hoisting the rig with its own power, but as a safety precaution decided to use the multiple hand winches.

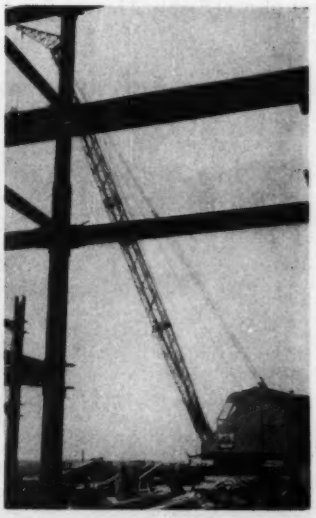
From the 11th floor the crane erected all steel through the 15th floor, and then the floor slab was poured at the upper level to take the crane on its second jump. While working on the 11th floor, the top crane reached over and picked up some of the steel members parked on the 7th floor by the lower crane. The rest of the material was hoisted to working level by a Chicago boom on a material hoist tower.

After the second jump had been made to the 15th floor, another 10 ft were added to the crane boom, making it 60 ft with an 8-ft jib, for erecting the two top floors and high steel for a penthouse and cooling tower. All upper floor material was delivered by the Chicago boom, which had been raised to the 15th floor level.

Lowered from Cantilever Beams

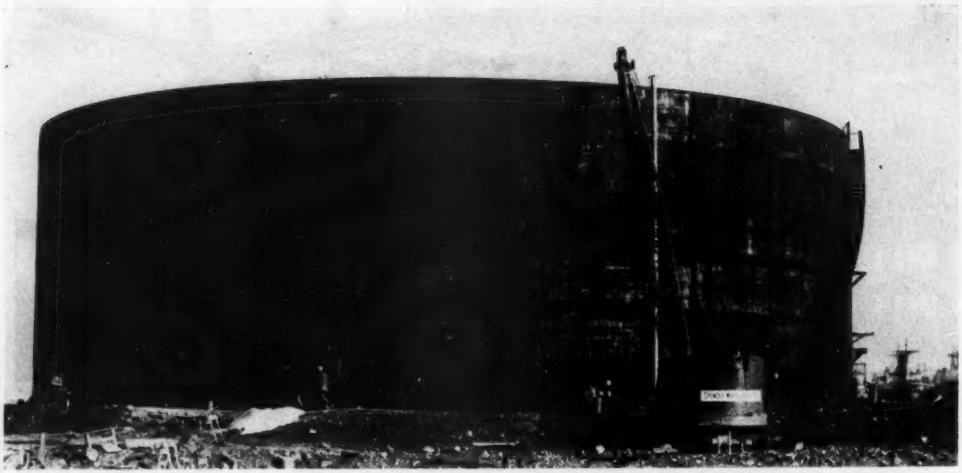
Lowering the crane back to the ground was a simple job. Two 18-ft beams were cantilevered 6 ft out from the top floor as a hoisting frame. Then a line from a hoist on the ground picked up the dismantled rig and lowered it down the outside of the building.

B. P. Sloan was superintendent for Atlanta Steel Erectors, Inc., of Atlanta. Long Construction Corp., Kansas City, was general contractor for the project. Information and pictures were supplied by Henry C. Hummel, Southeastern District Representative for the Schield Bantam Co. of Waverly, Iowa.



CRANE ON SKIDS walks through upper-story steelwork just as if it was working from ground level.

Big Steel Tank Floated to New

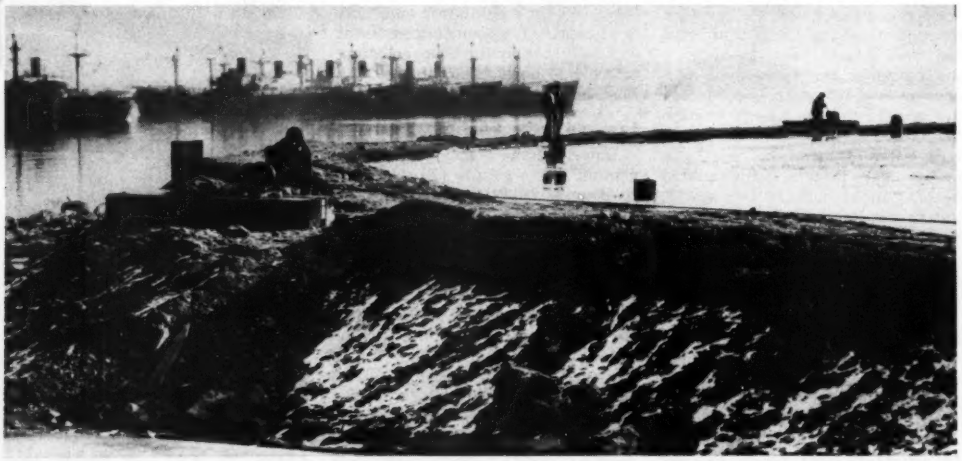


From Here • • •

5½-million gal tank, 140 ft dia and weighing 450 tons, is afloat ready to start 200-ft trip in levee-enclosed pool. Hand crabs at far end pull floating tank; line from crane in foreground acts as snubber.

PRECISION CONTROL of every movement and careful attention to every detail featured floating of a 5½-million gal steel tank 200 ft to a new location on the west bank of the Hudson River at Tomkins Cove, N. Y. The tank, 140 ft dia and 48 ft high, is part of the Hudson plant of Rockland Light & Power Co. Though it weighs 450 tons empty, it is fairly light in construction, being made up of butt-welded side plates varying from 15/16 in. thick at the bottom ring to ¼ in. at the top. The roof of ¼-in. lap-welded plates is fastened to the top rim, but rides free on purlins that are supported by 13 interior steel columns. It was important not to rack or twist the structure while moving.

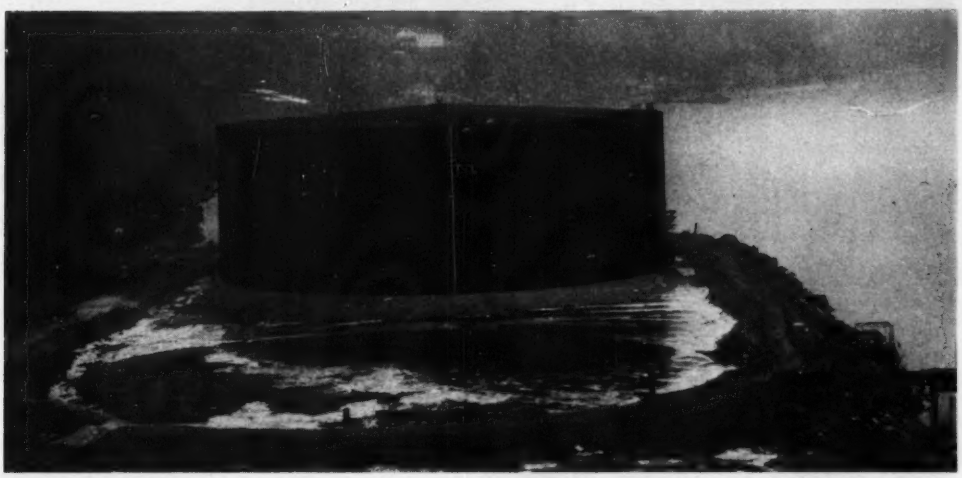
For the new base an earth fill was built up to El 6.33, about the same level as the old foundation, thoroughly compacted by bulldozers and a 10-ton roller. Then an earth levee of selected impervious



HAND CRABS at end of side levees, well anchored, pull floating tank to new position. Note pool elevation in relation to levee top; freeboard is only 6 in.

Position Under Precise Control

By ALBERT DI GIACINTO, Senior Engineer
Spencer, White & Prentis, Inc., New York



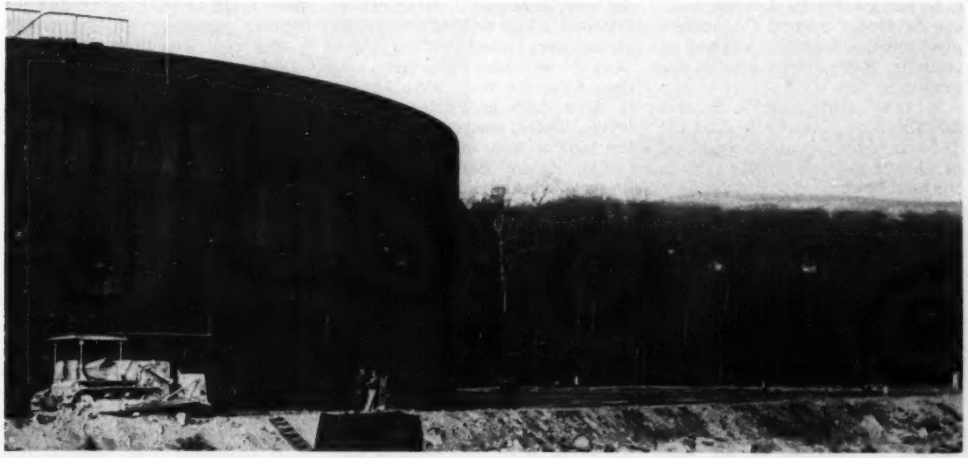
• • • To There

Tank is landed in final position and water has been drained from pool into nearby Hudson River. Pile fenders around old tank location, to which structure was lashed while being lifted, are visible in foreground. This view also shows levee construction.

material was thrown up to El 9.0 to enclose both old and new sites. Levee base was 16 ft wide, inside toe was kept 4 ft away from the tank at both locations, and the fill was well compacted by bulldozers. Top was wide enough to accommodate a bulldozer.

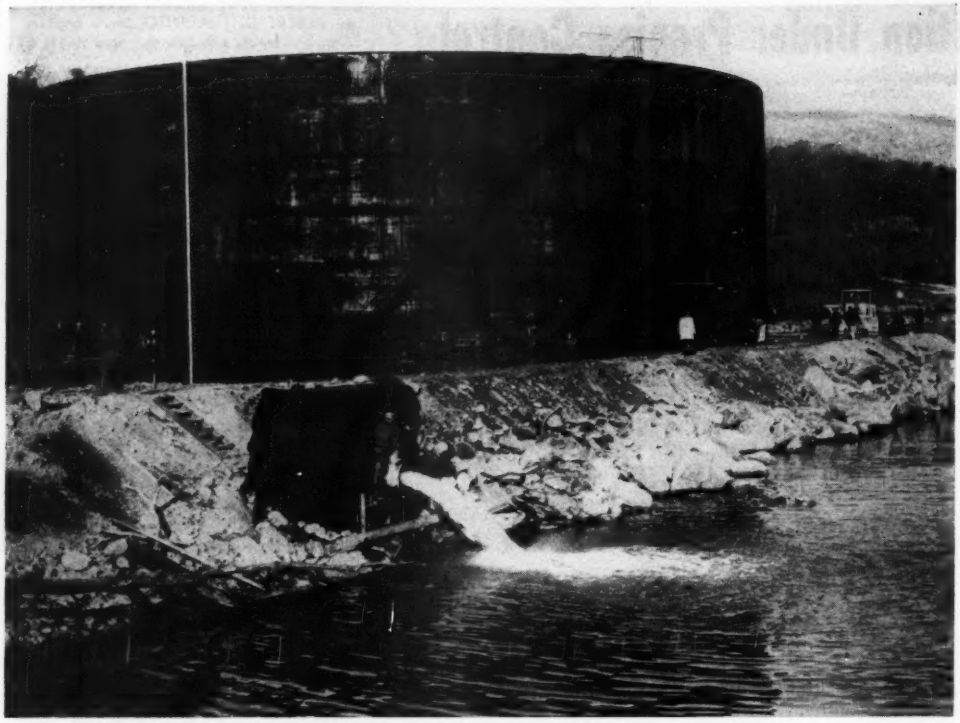
To hold the tank in position while the pool was being filled, and again to spot it in final position, five 20-ft fender piles were driven around each end of the two locations. Buffers of 12x12-in. timber blocks were inserted between piles and tank with ½-in. clearance.

To fill the pool within the levee to El 8.5 required 1½ million gal pumped from the power company's pump plant through a 6-in. pipe. A sandbag revetment on the inside levee slope at the intake prevented bank erosion. A bypass pipe near end of discharge line permitted diverting the pumped flow into the river without shutting down the pumps in case of emergency. A



ON ITS WAY. Tank moves forward in pool under pull of hand winches at extreme right, while crews on each side with hand lines guide floating structure laterally.

(Continued on p. 58)



MISSION ACCOMPLISHED, and tank settles down to final position as water is drained from pool. Tractors had to help hand winches in last few feet of move to overcome ice resistance.

12-in. outflow line with a gate valve at outboard end was buried in the levee bottom. Here, too, the inside bank slope was protected by sandbags.

Both levee and pool base proved to be remarkably tight. Some leakage developed around the outflow pipe, but this was soon stopped by tamping fine material around the sandbags.

A water depth of 11¼ in. was calculated as required to float the 450-ton tank. Additional 12-in. depth was allowed for the belly in the tank bottom when it was afloat. Actual performance checked these calculations closely. With the pool at El 8.5, 2-in. clearance was obtained over the high point of new foundation, El 8.33. Maximum depth of water was 3½ ft.

Extreme care was taken to control precisely the lift and movement of the tank. A master gage was set in the pool and four gages were painted on the tank sides at quarter points. To make sure that suction or cohesion of the tank bottom did not interfere with flotation, 12 plugs in the tank floor were removed and replaced with capped pipes that could be used as jet pipes if needed. This precaution proved unnecessary.

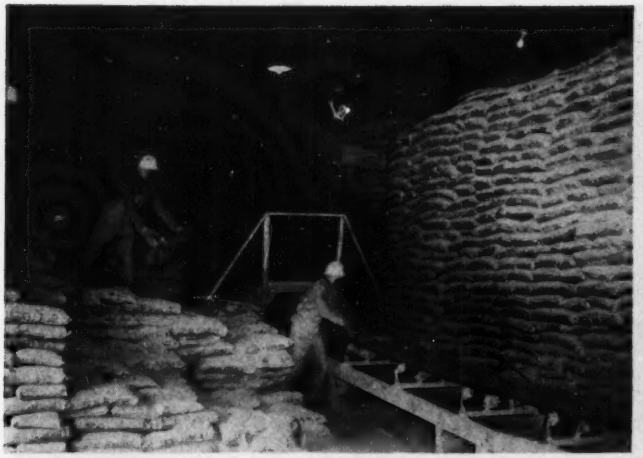
To hold the tank in position while it was being floated off its old base, three pair of ¾-in. cables, fastened to lugs welded to the sideplates, were lashed to three fender piles. As an added precaution, side lines from the tank were hooked to draw bars of tractors on the levee. There was no chance for the tank to take off half afloat.

Two 5-ton Beebe hand-crab hoists, anchored to pile deadmen, pulled the floating tank from old to new location. These hoists were set on the two sides of the encircling levee, near the new location end, for a straight pull down the pool. Their ⅜-in. lines were attached to opposite sides of the tank. When afloat, the tank was moved steadily by these lines.

Two more precautions were taken during the move. A Manitowoc crane was spotted outside the levee at the old location end, and its load line was run direct from the drum to a lug on the tank to serve as a snubber. To guide the floating tank laterally, three men walked along each levee handling side lines. The tractors were never very far away, and in case a sudden wind sprang up these lines could be snubbed around the rigs as anchors.

The pool was filled during the night, and the tank was fully afloat by 4 am. Moving started about 10 am, and was completed in 55 min without mishap. Then the pool was drained, and the tank was landed in final position at 1 pm. The job was done last winter, and some ice formed in the pool. The tractors had to help pull the tank into final position because of ice jamming up ahead of the tank at the end of the pool.

The tank was moved by Spencer, White & Prentis, Inc., with the author in charge of the work. The work was done for the Rockland Light & Power Company, S. L. Lovett, manager and vice-president; and under the direction of E. N. Wilbur, project engineer, with whom the author worked out the details of moving.



SACKED CEMENT for 290,000 cu yd of spillway concrete for Idaho dam is stored in warehouse and loaded on to conveyor leading to cement-sack cutting and emptying machine.

CIRCULAR SAWS will rip paper sack open as it slides over them after leaving conveyor.

Machine Empties Cement Sacks

TAKE ONE PART of a potato-harvesting machine, a section or two of conveyor belt, two power saws, some electric motors, and mix well with a liberal portion of ingenuity—and you've got, for want of a better name, a "mechanical cement-sack cutter, dumper and bag disposer."

That's just what Morrison-Knudson Co. has done at C. J. Strike Hydroelectric Development, a dam and powerhouse being built for Idaho Power Co. on the Snake River near Grandview, Idaho. And, what's more, the hybrid contrivance works like a charm.

Sacked cement being used for the earth-fill dam's 290,000-cu yd concrete spillway section posed the problem of costly hand labor to empty the bags by conventional method. But the job-developed and job-built mechanical device not only licked the problem but completes the operation four times as fast as the old hand method—and flips the empty sacks into an incinerator for good measure.

It works like this: The cement sacks are loaded by hand (the only labor involved) on to a conveyor belt passing through a long storage shed. Spaced at 8-ft

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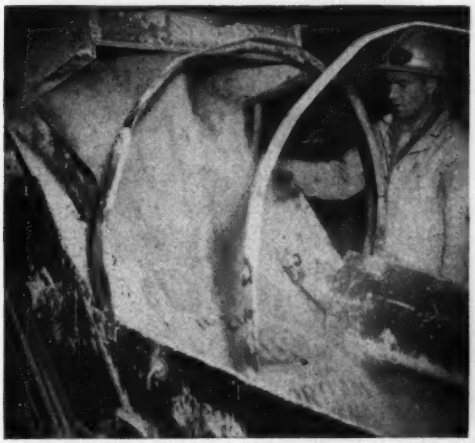
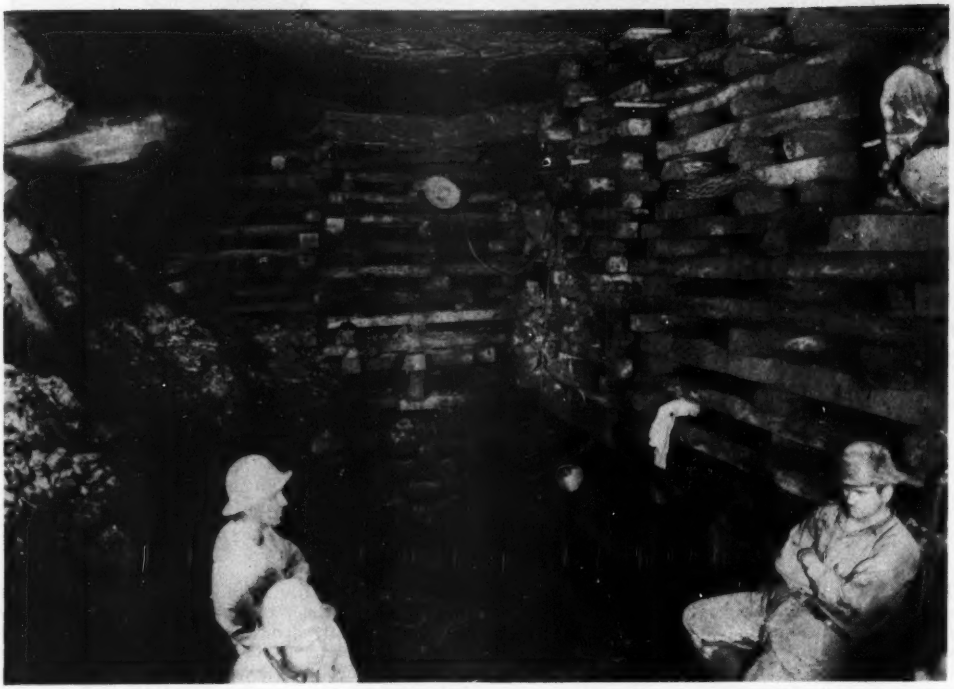


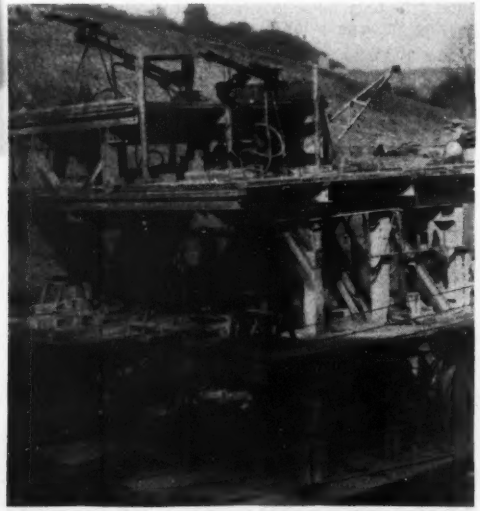
IN OPERATION, saw blades zip through bags at rate of 23 per min. Sliced sacks next move to vibrating chain to be emptied.

END OF LINE for cement is in plant storage silos; end of line for sacks is incinerator (foreground) made of steel sheet piling.

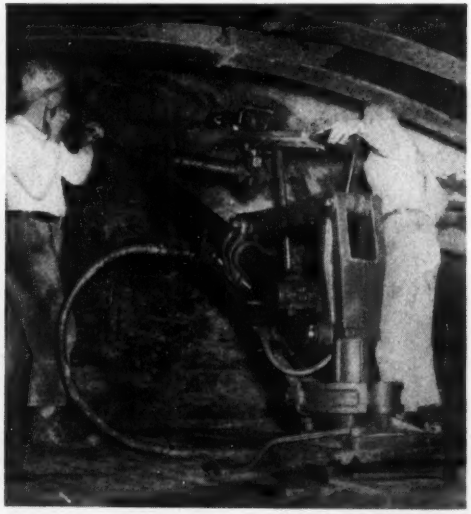
How Tough Can a Tunnel Get?



ROOF OF OLD COAL MINE is supported by crown bars and cribbing in B. & O. RR Tunnel No. 1 near Clarksburg, W. Va. Back end of crown bars is carried by steel sets in main tunnel. As steel is advanced, old mine is cleaned out; voids overhead are filled in with cribbing as shown in background. Progress here is slow and extreme care must be exercised constantly.—B. & O. RR photo



TUNNEL DRIVING started off in fine style with this 3½-deck jumbo mounting seven I-R mechanical booms carrying the drifter drills. Two bottom decks fold down to pass shovel and muck trucks.



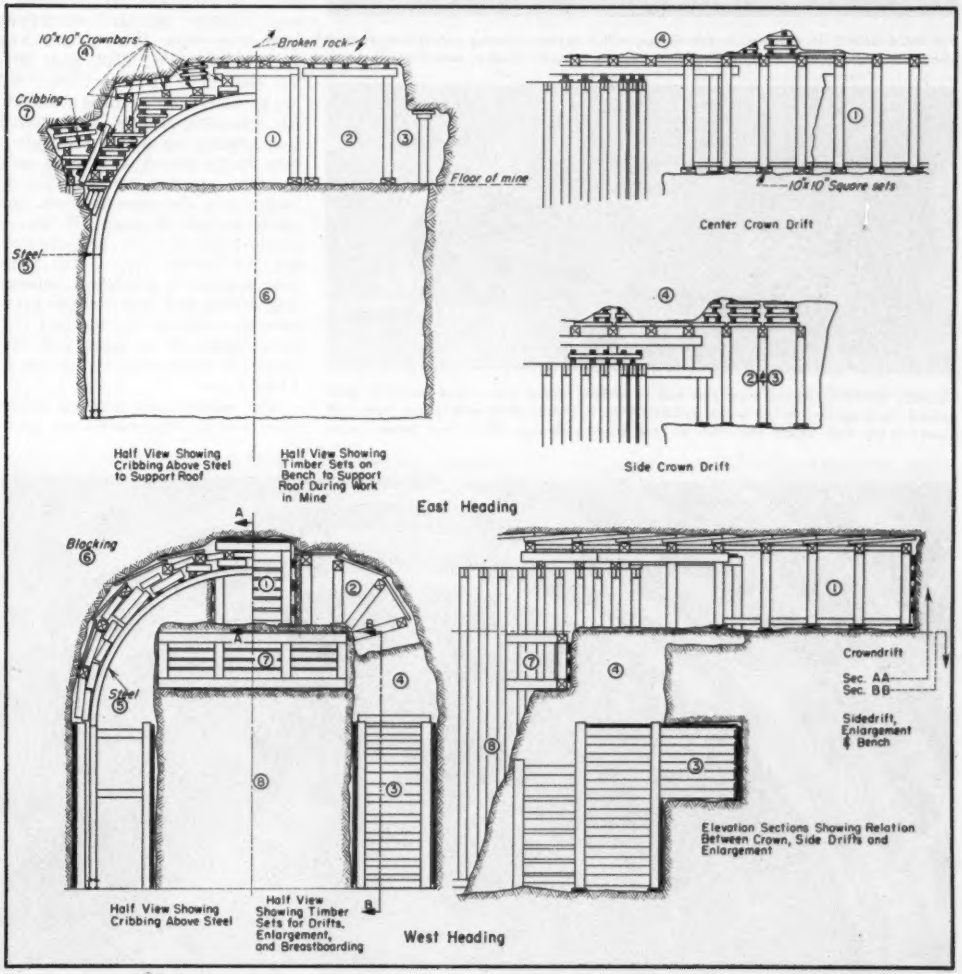
MECHANICAL BOOMS carrying drifter drills reduce drill moving and spotting time to fraction of that required with bars and columns. This is top center drill riding poop deck above main deck.

. . . Old Coal Mine Turns B & O. RR's No. 1 Into Nightmare

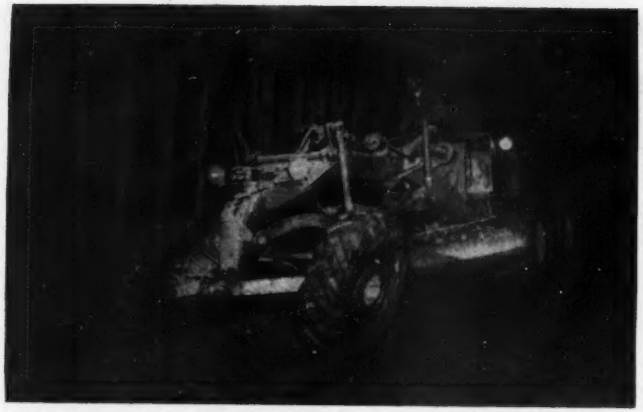
By HAROLD W. RICHARDSON, Editor

IT'S A BIG TUNNEL, roughly 36x 36 ft excavated dimensions with a semicircular roof, but not very long for a railroad tunnel—only 3,236 ft. Yet the Baltimore & Ohio RR's relocated Tunnel No. 1 on the main line just east of Clarksburg, W. Va. has run into an abandoned sloping-floor coal mine, encountered first at tunnel roof level, to make it one of the toughest jobs ever driven. Every trick in dry-ground tunneling—steel supports, breast-boards, forepoles, crown bars and cribbing—is being used in an effort to hold and clean out the old workings above and around the new bore.

Sure, the railroad engineers knew the old mine was there when they laid out the new tunnel 450 ft south of original Tunnel No. 1 driven 99 yr ago and now a single-track bottleneck on an otherwise double-track main line, with some bad reverse curve approaches to boot. They knew from underground maps of the mine that the abandoned workings lay well above proposed top of tunnel at the east portal, sloped downward in the direction of tunnel centerline toward the west, would intersect the railroad bore roof some



HERE IS THE GENERAL PLAN of attack at present in both east and west headings. It's a nice layout, but difficult to follow at times, because the old mine workings refuse to cooperate and stay put until all this beautiful timbering can be placed. Figures in circles indicate sequence of operations. Cribbing behind steel sets is left there, to rot eventually. Tunnel lining holds later rock falls.



STRANGE SIGHT in a tunnel is this Galion motor grader cleaning out drainage ditch along side. Also grades floor as haul road for muck trucks (Euclids and Tournarockers).

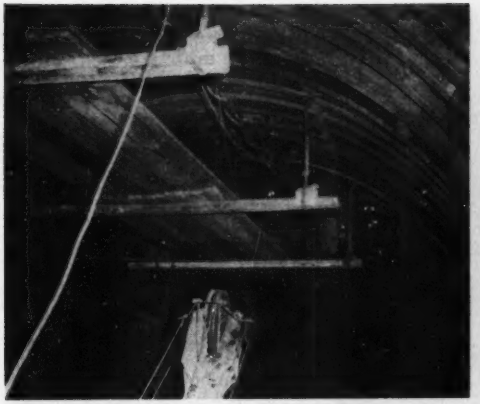
TUNNEL DRIVING started from east end in routine fashion from sound portal in good ground. Form section for barrel at portal is here in place, along with portal forms. I-R blower at left kicks 21,000 cfm fresh air into heading through 30-in. steel delivery pipe.

1,200 or 1,300 ft from the portal, and would continue dropping downward into the tunnel cross-section to about invert level at the west portal. They knew the mine support pillars had been robbed to some extent as the mine was closing down. Core borings were made, but they were largely meaningless, because unrecovered cores could indicate shattered rock, debris-filled caverns, or even open workings.

But these same B. & O. engineers, teamed up with the same contractor, Bates & Rogers Construction Corp, of Chicago, had successfully driven the Lough Tunnel not so long ago on a new coal spur line through what everybody thought was under similar conditions (CONSTRUCTION METHODS AND EQUIPMENT, Dec., 1948, page 36). Yet conditions at Tunnel No. 1 did not prove similar to those at Lough. At the latter tunnel the ground surrounding the old mine workings was fairly sound, requiring only cribbing up and cross-bracing to make sure the cavern roofs and walls stayed in place. It was a single-track tunnel, and shorter, too. At Tunnel No. 1 this mine area ground is shattered, squeezing, sliding and under terrific pressure, as evidenced by the fact that some places the original 9-ft coal seam has been squeezed down to 11 in!

The contractor's original intention was to concentrate all plant

NICE GOING IS NO MORE, for the tunnel has now run into the old mine. This view shows the mine roof supported by crown bars right after the face has been shot for another round. This was taken shortly after the mine was encountered—not so tough tunneling as was encountered later. Floor of mine keeps dropping as tunnel progresses, has to be "worked" ahead of tunnel.—(B. & O. RR photo.)



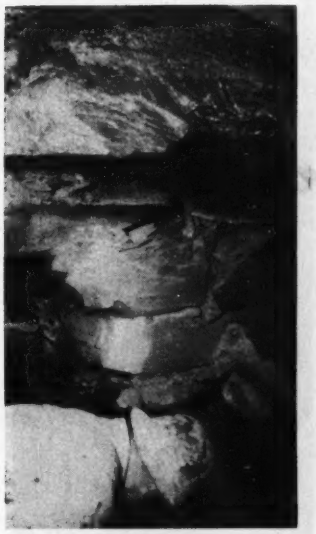
ACCESS TO OLD MINE WORKINGS above tunnel roof in east heading is by flying gangway hung from steel sets, connecting jumbo with top center drift. Bob-tailed Lima diesel shovel (boom in foreground) is squeezed in between jumbo and tunnel face

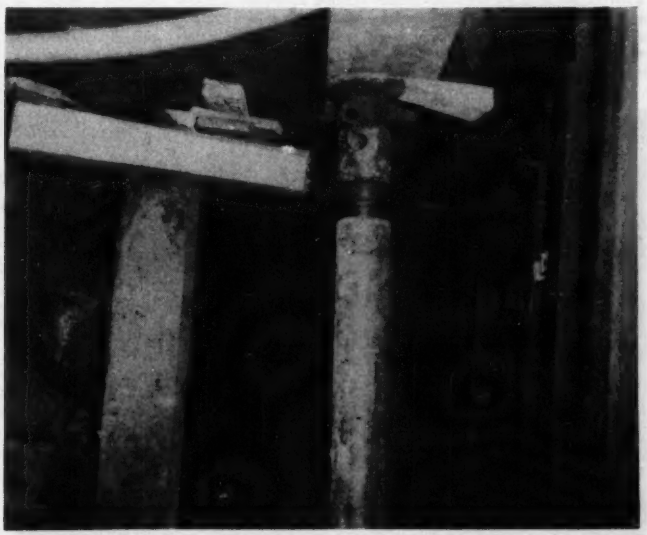
FIRST STEP in attacking old coal mine ahead of tunnel is to drive top center drift through abandoned workings. Muck, shoveled out by hand, is dragged over tunnel face by slip scraper hauled by air-hoist line. Going is painfully slow, operations behind schedule.

at the east end and drive from the portal only. The portal was turned in Sept., 1950, and driving started on a routine schedule that contemplated holing through last month. (It will now probably be sometime next summer).

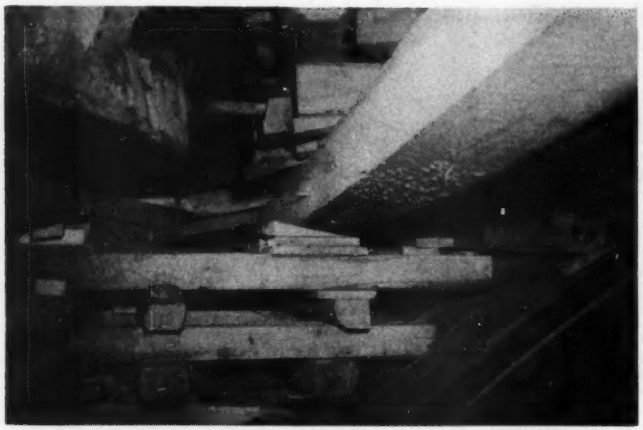
The tunnel is big—31-ft wide clearance inside of 22-in. concrete lining, 12½ ft high from top rail to spring line, then 15½-ft radius to concrete lining in the side — all adding up to about 36x36 ft excavated dimensions. There is a tile-lined concrete gutter along each sidewall behind a concrete ballast wall. Steel lining was specified throughout (furnished by Commercial Shearing & Stamping Co.), consisting of double 8-in. 23-lb sills 8 ft long, 8x10-in. 33-lb wall posts and two-section 8x10-in. 39-lb ribs sitting directly on plates on the wall posts. Steel sets are spaced 2 ft c. to c., though specs allow 4-ft spacing if the ground permits. Wall posts are backed up with horizontal wood lagging and stone packing. Metal pan bar lagging is clipped to arch ribs to divert drainage to the sides, and dry stone packing is placed behind the pans.

Driving started late in September under a schedule designed for 96-ft progress per 6-day week. This rate was exceeded during Nov., Dec. and early Jan., but on Jan. 19, the coal mine was intercepted 1,218 ft from the portal throwing all operations off schedule. Everything was going along fine up to that point. A 3-deck jumbo, with a poop deck on top, was built to ride wide-gage tracks. The jumbo mounts





GOING GETS TOUGH in some of the side crown drifts. At left is typical shattered rock found above the old coal seam. This treacherous ground has to be caught up at once by posts and wedges and screw jacks (right) until enough of it can be removed to install square sets that later can be supported by crown bars. Timbering at extreme right is outside of center drift sets, helps support roof.



TUNNEL FACE IS ADVANCED in east heading under protection of crown bars supporting mine roof. Here's how crown bars take off from steel sets. Side drift supports (top) are carried from cribbing on top of steel; center drift bars (bottom) rest directly on top of the steel. These bows in crown bars aren't optical illusions—the timbers sag from the tremendous weight overhead. Steel sets follow along to help support crown bars.

seven new type Ingersoll-Rand DJB2 mechanical booms carrying I-R DA35 drifters. These drill all holes except the lifters and bottom relievers, handled by additional drifters on conventional bars mounted beneath the lower deck.

Up to the time the mine was encountered, three patterns of drilling and shooting were used, depending upon ground conditions. Details are given in the accompanying table.

Drilling is handled with Ingersoll-Rand conventional detachable bits, sharpened by grinding at the job. A battery of six 505-ft V-type Gardner-Denver compressors, each driven by a 125-hp Westinghouse motor, supplies the high-pressure air. Ventilation is by an I-R 21,000-ft blower furnishing air to the heading through a 30-in. spiral-welded pipe.

Muck is loaded by a bob-tailed 2-yd Lima diesel shovel, with shortened boom and dipper stick, into 10-yd Euclid end dumps and 7-yd Tournarockers, both diesel-driven. The Tournarockers can turn around easily in the tunnel and then back up to the shovel. Euclids are turned by running the front wheels on to a steel skid plate and the front end is then jerked around by an air hoist.

Because both the steel sills for the steel support sets and timber sills for the jumbo track are laid on the ditch bottom, the ditches are drilled and shot with the face. A 1½-yd Hough Payloader is proving mighty handy in loading out the muck from the ditches. A Galion grader (strange sight in a

(Continued on page 66)

ONE OF THE NEATEST TRICKS we've seen in maneuvering heavy equipment is backing the Tournarockers through the jumbo (left) alongside the Lima shovel for loading out muck (right) cast down over the face from the mine drifts overhead.

What do you want a bearing to do?

CARRY HEAVY LOADS? If you need top load capacity in bearings, Timken® roller bearings can give it to you. Due to line contact between rollers and races, Timken bearings have extra load capacity —one big reason why they're used in the sheaves of the heavy-duty shovel above.

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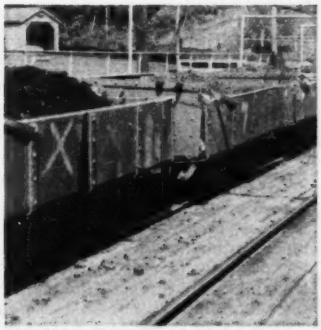

MINIMIZE FRICTION? What makes these mine cars easier starting? Timken bearings on the axles. Due to true rolling motion and smooth surface finish, Timken bearings minimize friction. And Timken bearings *stay* friction-free because their case-carburized rollers and races resist wear.

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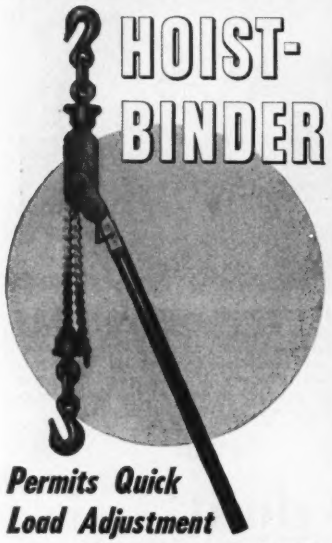

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AT THE WEST END the going is even tougher, for here the old mine workings reach down to tunnel invert level. This shows the procedure in reclaiming the heading after a disastrous slide that nearly carried away the steelwork shortly after the heading was turned. Note extensive breastboarding necessary to hold the face in all drifts.—B. & O. RR photo

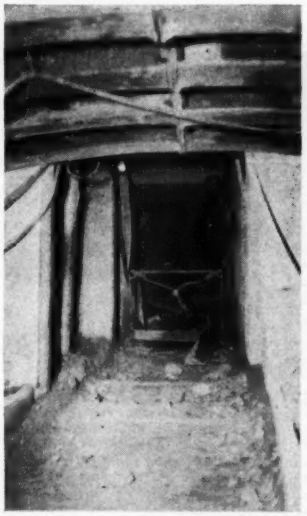
tunnel) keeps the ditches clean, and also grades the roadway for the muck trucks.

It's a Different Tunnel Now

The foregoing description applies to the conventional tunneling methods pursued before the mine was encountered, and now to that part of the operations pertaining to driving the face after the overhead mine chambers have been picked up—all in the east heading. Because progress was slowed so much in this heading, the contractors recently opened up the west portal, too, but more of that end of the tunnel later.

Operations at the east end have changed entirely since the mine was entered. At first, of course, since the mine floor slopes downward from east to west, the old workings were all above top of tunnel steel. As driving in the east heading progresses westward, the mine floor drops lower and lower into the tunnel area. The mine is worked ahead of the tunnel face.

When we last visited the job (mid-July) the mine floor was 6 or 7 ft below top of tunnel steel. The drill jumbo was parked about 50 ft from the face, and access to the mine workings was by a flying gangway leading off the jumbo top deck, hung from the steel



FOCAL POINT of attack at west end is small top center drift protected by square sets. Job-made scraper hauled by air hoist drags muck to main face through opening.

ribs. Steel is carried just as close as possible to the face.

As you scramble through the mine workings, not far beyond the face and always under the protection of new timbering, the whole operations seem like a mess, with

out plan or reason. But as you study the job, you can see there is a definite plan toward which they are trying to work, though the variations are numerous. Here's what they are trying to do and Ben Ornburn, Jr., Bates & Rogers job engineer, drew the accompanying sketches for us to help explain the operations:

A top center drift is carried up to 50 ft ahead of the main tunnel, its roof never lower than 2 ft above top level of tunnel steel. This drift is shored up with square sets of 10 x10-in. timbers. Side crown drifts are likewise carried along 25 ft ahead of steel and where possible they are shored up by similar square sets. The idea is eventually to erect enough square sets so their top struts can be picked up by 10x 10-in. crown bars, 18 ft long, one end resting on the tunnel steel, the other end shored up from the mine floor. Thus, the crown bars, spanning 10 to 12 ft clear, support enough of the mine overhead to let 4- or 6-ft rounds to be drilled and shot from the face. Then two more sets of steel are put in, with a third set temporarily placed between these two for additional crown-bar support.

Dangerous, Exacting Work

Advancing the drift is an inch-by-inch fight against shattered rock, squeezing ground, old mine timbers and slipping coal seams. To get the square sets in place requires an amazing amount of temporary bracing with wedged posts, cribbing and steel jack shores placed in all directions. Loose stuff is barred down from under the protection of timbering. Excavation is painfully slow, often with half-stick pop shots.

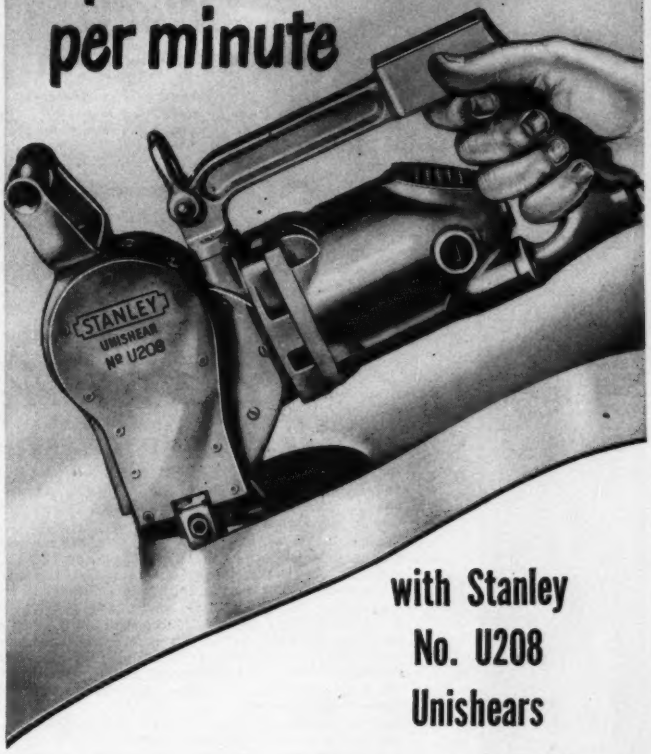
All voids above the square sets are cribbed up, and this is always dangerous and exacting work, even if it is possible to get some long posts temporarily in place to help hold the shattered mine roof until it can be caught up by the cribbing. Muck is shoveled out by hand from the side drifts, but a slip scraper hauled by an air-hoist line helps clean out the center drift.

Muck from the drifts is cast down over the face. The Lima shovel works between jumbo and face to load this muck into the Tournarockers. Backing these machines through the jumbo and alongside the shovel in the murky light is an operator's achievement.

Once the crown bars are in, all the other temporary timbering has

(Continued on page 70)

Cut 8 gauge sheet steel up to 5 feet per minute



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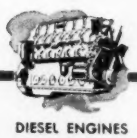

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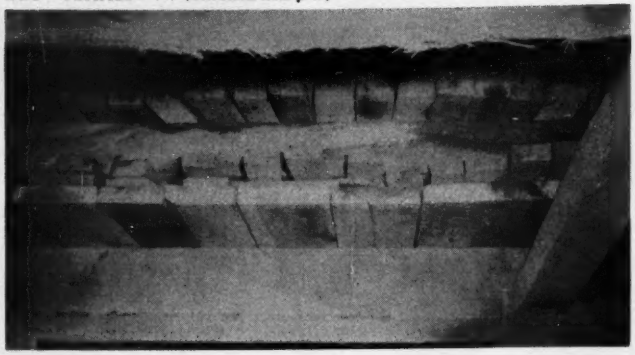
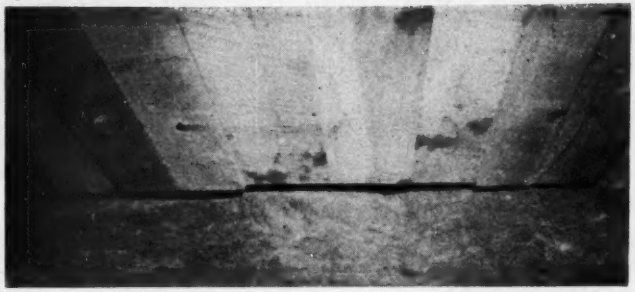




BEAUTIFUL JOB of forepoling carries roof of center drift in west heading. Top view shows how poles are driven above top of square sets to take up against face of drift (bottom), supporting roof by cantilever action. West side of mountain appears to be unstable.

to be removed under the crown-bar span before the face can be shot. Just as fast as new steel sets are placed in the tunnel, all voids outside the steel are filled with cribbing and timber packing. Eventually, of course, this timber will rot out, but probably not before the overlying ground has arched itself. The combined steel and concrete lining of the tunnel will take any and all rock falls that might come later.

West End Worse Yet

Conditions are even worse at the west end, where the portal has just been turned. Here the old mine floor is right at tunnel invert level, so the whole tunnel section is in bad ground. The accompanying sketch shows the procedure at this end.

First, top center drift is carried ahead by forepoling above square sets. Crown side-drifts are likewise excavated under forepoling, but this timber is driven crosswise from the center toward the sides, instead of from the face forward. Side-drifts for the wall posts follow next, in two steps, and at the same time the crown side-drifts are enlarged. Every drift face is protected at all times by breast-boards, and the side drifts are lagged along both sides.

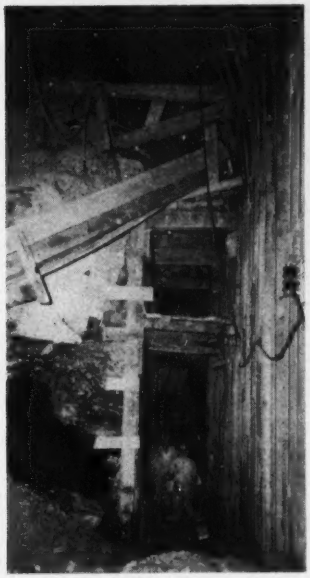
The central core is not touched until steel sets are in place and the roof is well blocked up to the steel.

So far but little drilling and shooting have been necessary, for the ground is broken up enough to permit excavating with air spades and moils. A home-made scraper cleans out the top drift; side-drifts are mucked out by hand. A 1½-yd Hough Payloader loads out the muck by backing out to the portal and dumping into a waiting truck. Air is supplied by a bank of portable compressors.

Shortly after the portal was turned, a slide nearly wrecked the whole works. That whole side of the mountain seems to be unstable, and work is being rushed right now to get the portal wing walls in place to hold it. But even here, the old mine is causing trouble, and as a last resort it was necessary to fill up the caverns under the wing-wall location with concrete, then re-excavate for the wall foundations.

(Continued on page 72)

SIDE CROWN-DRIFTS are excavated by forepoling crosswise from center drift. Rock is so shattered and soft here it can be broken loose by pneumatic spades and moils.



SIDE-DRIFTS follow behind crown-drifts for setting of wall posts (left), but first the double sills (right) must be set to correct line and grade. These side-drifts must be protected on all sides by lagging and breastboards. Advancing the drift is an inch-by-inch fight.

Typical Rounds, Full Section Tunnel

	HOLES			POWDER		
	No.	Length	Cu Yd	Lb	Lb/Yd	Delays
8-ft Full Face	172	1,460	330	675	1.8	10
4-ft Full Face	187	720	165	500	3.0	10
HEADING AND BENCH:						
1st 4-ft Hdg	30	120	30	30	1.0	8
2nd 4-ft Hdg	36	140	40	45	1.1	8
8-ft Bench	137	1,030	260	450	1.7	8

(Continued on p. 72)

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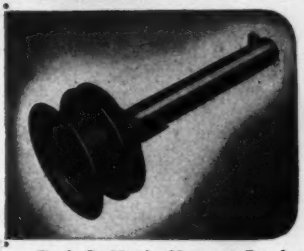

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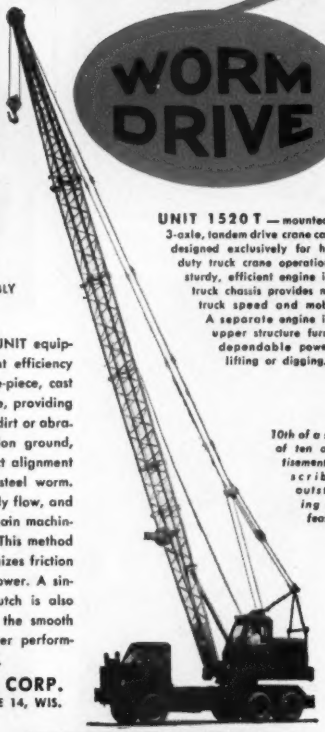

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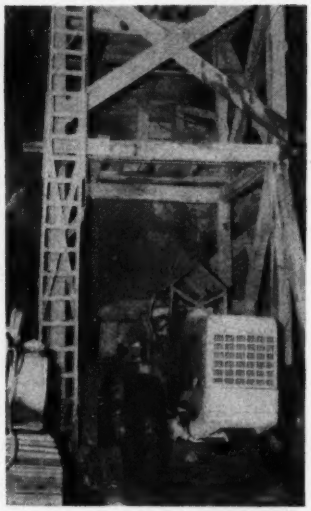

MUCK IS LOADED out at west end by Hough Payloader that scoops up spoil from central face and backs out of portal to discharge into waiting truck. Muck from top headings is carried to loader by chutes.

THEY LOOK HAPPIER than they have a right to be. Here are John Rogers (left), Bates & Rogers vice-president in general charge of the job, and Mike Warmbier, project manager, snapped in west heading right up against the top steel close to face.

The construction of this project is under the direction of A. C. Clarke, chief engineer; with general supervision by W. W. Gwathmey, Jr., engineer of construction; J. W. Jones, regional engineer; and design by C. E. Sloan, engineer of bridges, all of Baltimore, Md. G. E. Norris, resident engineer; and J. W. Packman, project engineer, both of Clarksburg, W. Va., are in charge in the field.

For Bates & Roger Construction Corp, Chicago, John W. Rogers, vice-president, is in general charge M. C. Warmbier is project manager, Carter Fore, D. M. Carlisle and W. Pack, John Gullans are shift superintendents. Vic Short is office manager and Larry Wesley is master mechanic.

YOUR BEST SCRAPER BUY

Every TC-170 owner will tell you that it's the fastest and easiest loading scraper of its size—yet it actually costs less per cubic yard capacity. It's recognized as the ruggedest scraper built. In simplicity lies extra strength and easier maintenance. Cables last longer. It dumps faster with less power. If you're serious about making more money, watch a TC-170 at work, and get comparative specifications from your Wooldridge distributor. You'll convince yourself that TC-170 success is no accident—and that you can profit by that success. It's your best scraper buy—by every comparison!

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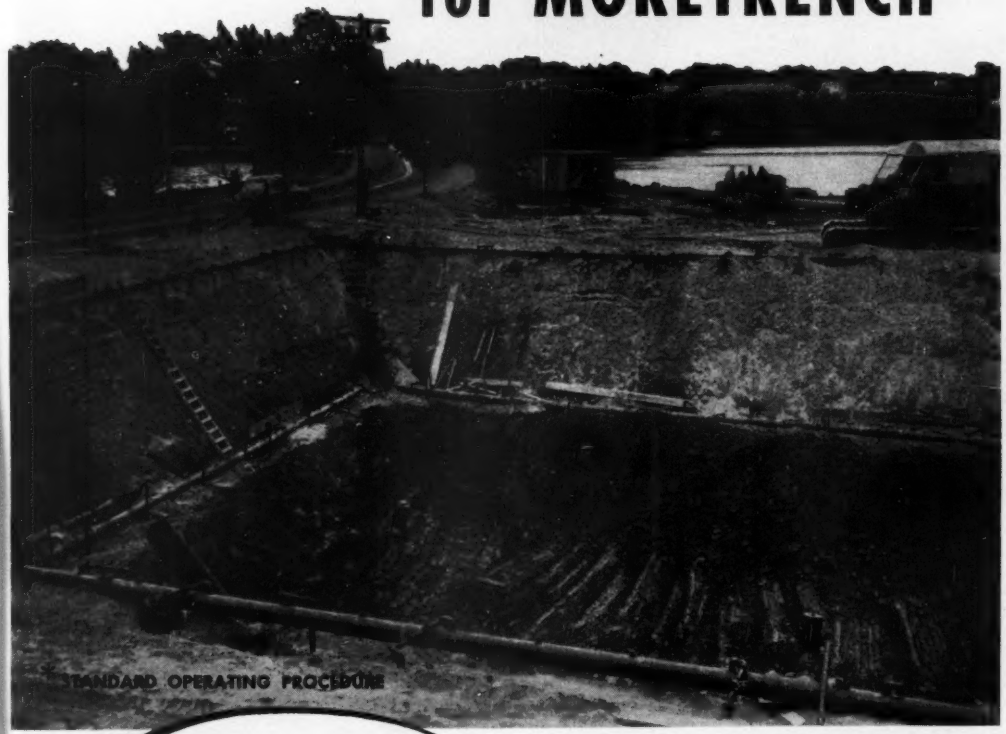
...and in self-propelled scrapers THE WOOLDRIDGE TERRA COBRA is your best buy for ruggedness, greater production, and simplified service...

—FIRST IN THE FIELD—AND STILL THE BEST

Dewatering fine soils is S. O. P.* for MORETRENCH



This is the Watchemoket Pumping Station in East Providence, R.I. Twenty-two feet of water in extremely fine sand and clay presented a pumping problem . . .

CONTRACTOR: "Are you sure your wellpoints will work in such fine soil?"

MORETRENCH: "We guarantee it!"

On May 31st pumping started at 2 P.M. On June 1st, C. L. Guild Construction Co., Inc., E. Providence, was excavating "in the dry."

The Moretrench combination of expert planning, careful installation, and superior equipment gets results every time.

To guarantee your profit on a wet job, pump with Moretrench!

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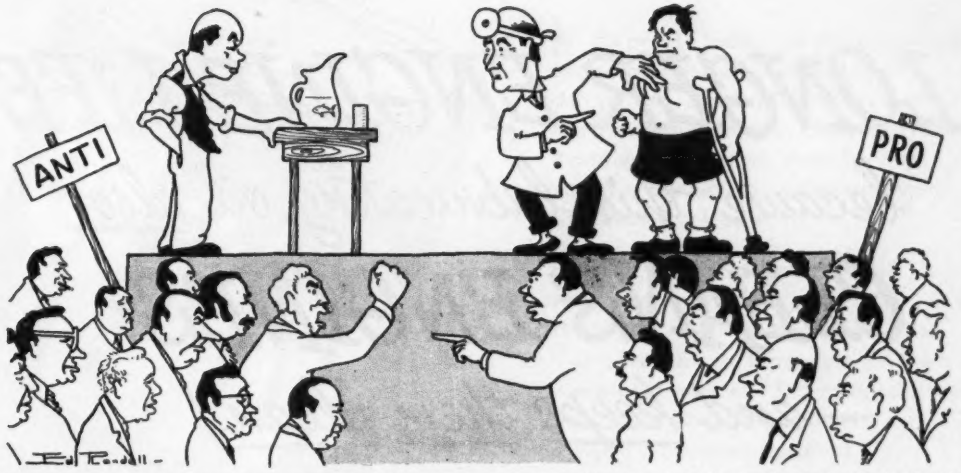


SPIKE SEZ: Glory be, what a battle! But what can you expect when you tackle such a controversial subject as pre-employment physical examinations for construction workers? That's just one big topic set up for panel discussion at the Construction Section National Safety Congress at Chicago October 9-10. Come on, all you construction guys, and take advantage of these instructive safety meetings.

Helpful Program Scheduled for Construction Safety Meeting in Chicago

A CONSTRUCTION SAFETY MEETING of special interest to contractors and construction engineers has been planned for the two-day session of the Construction Section, National Safety Council, at the Safety Congress to be held at Stevens Hotel, Chicago, October 9-10.

Sparking the meeting will be a panel discussion on the highly controversial subject: "Job Placement Physical Examinations." Discussion leader will be Joe DeLuca, safety director for DuPont's construction division. Panel members include: Allen Bulley and Morris E. DeWitt, contractors from Chicago and Poplar Bluff, Mo., respectively; Edgar F. Smith, vice-president, International Hod Carriers, Builders and Common Laborers Union of America; Dr. Harold I. Meyer of Illinois Bell Telephone Co.; and safety engineers S. K. Eastwood of American Bridge Co. and James D. Hoag of Atomic Energy Commission.

Other features of the session, which will be held in the afternoon of the two days, are: "Safety is Good Public Relations," by George M. Schmeltzer, Pennsylvania Chapter, A.G.C.; "Accident Prevention Made Easy," by Howard J. Schultz, U. S. Corps of Engineers; and "100 Ways to Save a Buck," by John A. Volpe, Boston contractor.

Section Chairman Harry J. Kirk, Associated General Contractors of America, will preside. Sessions start at 2 pm each day.

How to Control Your Costs for Increased Profits

WHERE DID THE MONEY GO? Many a rueful contractor has asked himself this question at the end of a job that wound up in the red. He should have asked it at regular intervals during the course of the work. And, more importantly, he should have had sufficiently accurate, detailed and timely answers to enable him to spot items starting to go sour, while there was still a chance to correct them and pull the job out of a hole.

Construction Cost Control, a top-notch manual for contractors, just published by the American Society of Civil Engineers, fully outlines a practical and easily applied system of accounting and records to give the right answers. It shows how to analyze and keep on top of operational and overhead costs and job progress.

Included are sections on estimating and preliminary work, the accounting system, classification of construction cost accounts, cost distribution, control of costs, contractor financing and tax problems. More than 20 full-size specimen accounting forms are bound into the leather-covered handbook. Clearly written and well illustrated, the book should be in the office of every contractor—large or small—who cares about his profits.

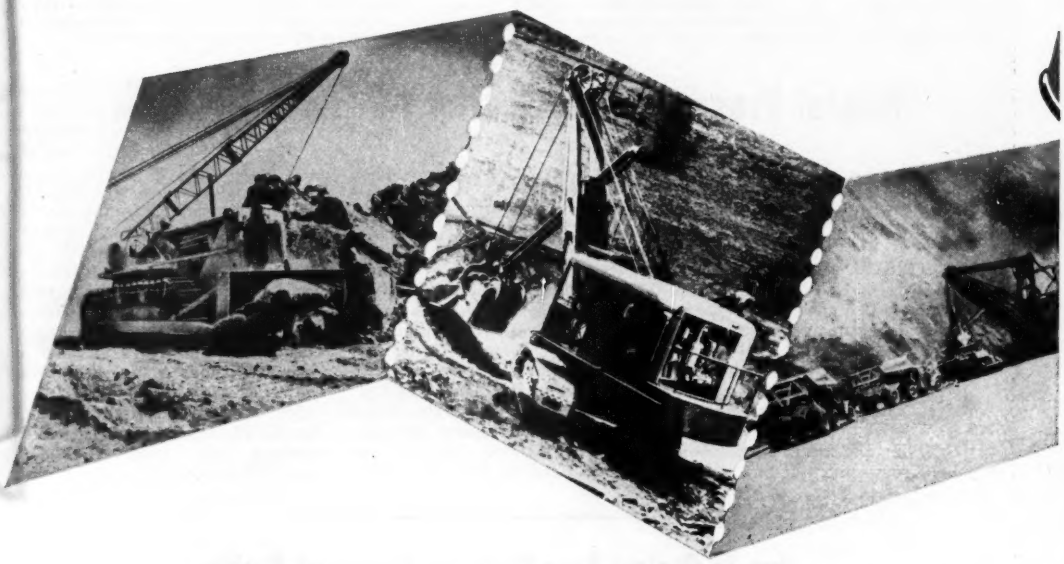
Construction Cost Control was written by men who know and are active in the construction field: Howard P. Maxton, Raymond Concrete Pile Co.; Arnold O. Babb, U. S. Bureau of Reclamation; and Donald J. Leitch, Mount Morris Dam Builders. Copies are $5.00 from ASCE, 33 W 39th St., N. Y. 18.

LONGER ENGINE LIFE

because this lubricating oil also

CLEANS ENGINES

—and keeps them clean!



- No more lacquering of pistons, cylinders, valves.
- TENOL keeps valves and rings from sticking.
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- With TENOL, engines stay clean — free from harmful sludge and carbon.
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Available in 55 gallon drums and 5 gallon containers

For over 15 years . . . in all types of diesel and gasoline engines in rugged, heavy-duty service . . . Sinclair TENOL® has been doing an outstanding job. TENOL has *proven* it provides long periods of trouble-free operation at sustained high power output, with lowered upkeep costs.

Sinclair TENOL is not to be compared with many alleged "heavy-duty" oils. TENOL is the real thing! You can easily tell if an oil is actually "heavy-duty" . . . See if it is approved under new Military Specification MIL-O-2104. TENOL far surpasses this stringent Government standard!

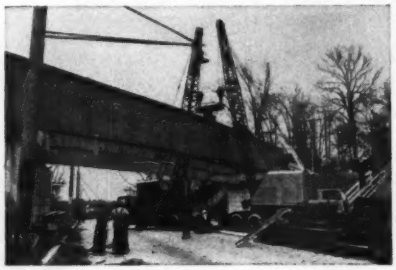
Save your valuable equipment — phone your nearest Sinclair Representative or write direct to Sinclair Refining Company, 600 Fifth Ave., New York 20, N. Y.

SINCLAIR TENOL
prolongs engine life

You can take on any kind of lifting job with a BAY CITY CRANEMOBILE

for high lifts . . . There is plenty of balance and stability in this 20 ton capacity CraneMobile to handle long booms and jibs. Here a "180" is reaching out to pick up a prefabricated top section of a 90 foot transmission tower. The worm and worm wheel boom hoist will raise and lower boom and load *only under power* either independently of or simultaneously with other operations.

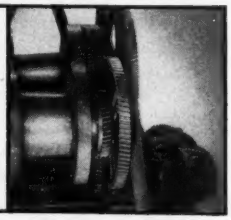
for heavy lifts . . . POWER and WEIGHT are always necessary to pick heavy loads. The BAY CITY CraneMobile has them both as shown here where the 25 ton capacity "190" lifts a massive rotary dryer. When lowering, the operator will engage the power load lowering device which permits precision controlled lowering against machinery and engine.



for twin lifts . . . Frequently an exceptionally heavy load requires cranes to operate as a team, as in this illustration where two 20 ton capacity CraneMobiles, working on a new railroad underpass, handle two girders each weighing 37½ tons. This job calls for *precision booming* and *precision load lowering*—BAY CITY furnishes both. For complete CraneMobile facts write us today. BAY CITY SHOVELS, INC. BAY CITY, MICHIGAN.

CHECK LIST
- 20-25 Ton Capacity
- Pin-Connected Boom
- Hi-Collapsible Gantry
- Independent Power Boom Hoist
- Precision Power Load Lowering
- Removable Counterweight
- Specially Designed Carrier
- High Road Speeds

power load lowering . . . A specially arranged Power Load Lowering mechanism for accurate control in lowering heavy loads is standard equipment on CraneMobiles. This device, independent of the boom hoist, automatically lowers the load at about one inch per second on six parts of line without use of brakes. The mechanism can be quickly engaged or disengaged.



189

BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

THE *Maintenance Shop...*

A MONTHLY EQUIPMENT SERVICE AND REPAIR FEATURE

Good Ignition Spells Economical Engine Performance

BY HOMER C. CAMPBELL
Service Manager
H. W. Moore Equipment Co., Denver, Colo.

WHILE IT IS TRUE that most heavy construction equipment is powered by diesel engines, many thousands of units are powered by the conventional gasoline burning motors. In many cases we have been so involved with diesels that not enough thought is given to the spark ignition of the other engines. Therefore, we should review the matter of ignition systems and make it a serious part of our preventive maintenance program in order to get maximum efficiency from gasoline engines.

One of the first and most important items is the battery. Check it periodically with a hydrometer, and keep the electrolyte at the proper level by the addition of distilled water. Check the cranking load voltage of the battery

with a cell-testing voltmeter. Check the hold-down arrangement and make sure the battery is secure in its carrying case. Inspect the battery ground cable and the battery-to-starter cable for corrosion, loose connections, breaks or fraying. If bad, they should be replaced. Clean all connections so that they have good contact.

The starting motor should have a thorough inspection regularly for worn brushes, weak or broken brush springs, dirty or rough armature, worn bearings, loose field pole screws, or loose mounting cap

screws. Check the Bendix assembly. The starting switch is a cause of lots of lost time—give it a look-see. One of the most prevalent causes of starter trouble, in cold weather, is the weight of oil in the engine crankcase and in the transmission. Transmission drag can be lightened by releasing the clutch. However, heavy oil in the engine will impose a heavy drag on starting motor and battery.

Reliable checking instruments are a great aid in inspecting condensers and coils. Check the distributor cap for cracks, corroded sockets and burned posts, which should be cleaned up and repaired or replaced. Inspect the distributor rotor for cracked bakelite and burned tip. Excessively burned or pitted distributor points should be replaced. When making replacement be sure that the spring contact is free on the pivot and that it has the proper spring tension; the new points must be properly spaced and make full contact. Low tension or primary circuit wires should be checked for loose connections and bad insulation. Inspect the high tension cables for corroded terminals, broken insulation or burned cores. Corroded terminals and cables with bad insulation should be replaced. When replacing the ends or installing new cables be sure that they are seated properly in the coil and distributor cap sockets.

The generator furnishes the motive power for the rest of the ignition system and needs good inspection. Check for burned brushes, weak or broken brush springs, dirty or rough armature, and loose bearings. The fan and generator belts should be checked for condition and adjustment. Then, with the proper ammeter and voltmeter, check the charging rate of the generator. If adjustable, it should be properly set; otherwise, check and adjust the voltage regulator.

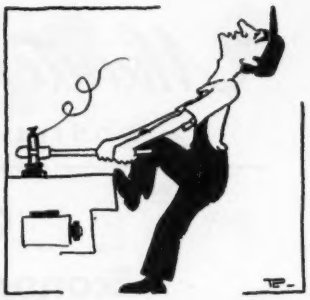
Next, inspect, clean and reset spark plugs or replace with proper

plug. Finally, check ignition timing, and properly set if need be.

In the final analysis the most important items affecting good economical engine performance are the spark plugs. Without them the rest of the electrical system is useless, the unit is dead, and down time is knocking at your door. Under today's operating conditions spark plugs really take a beating. From a cold start, the plugs must run and perform efficiently under a temperature as high as 1,500 deg in just a few seconds. Each plug must deliver many thousands of

good hot sparks per hour and must withstand repeated explosive pressures at many hundreds of pounds per sq in. The only way to test these plugs is in the engine itself under actual working conditions.

There are only a few things that can happen to a spark plug: It may be worn out, it may have dirty or fouled insulators, the spark gap may be wrong, or the insulator may be cracked or broken. Various factors affect the wear of spark plugs. Stop-and-go driving, high speed and heavy duty operation all play a part in spark plug life. Fouling is caused by black carbon and soot deposits from poor carburetor setting, worn piston rings, poor ignition, wrong type of plug and intermittent operation. Spark plug gap is caused by use or by poor original setting. It will cause hard starting, missing out at high speed or under heavy loads, and poor power. Insulator breakage outside is caused by human carelessness. Inside failures are due to the use of improper plugs for the engine heat range and operating conditions. Continued detonation, spark knock, ping or pre-ignition may also break the inner insulator. Dirty, worn out spark plugs not only cause poor engine operation but cost money in poor fuel economy and lost work.



All of these items that affect economical engine operation are small in themselves. Yet they are so essential to on-the-job production that lack of periodic inspection and service of any one of them may lead sooner or later to unprofitable operation for the owner.

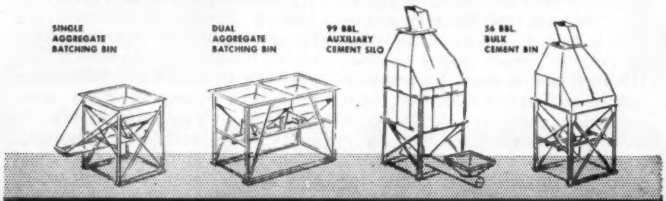
To solve any storage problem

Put the pieces together

GAR-BRO UNIT BATCH PLANTS

ASSEMBLE THE UNITS in any combination to meet your batching or storage requirements. They're engineered to handle aggregate and/or bulk cement and are easily re-arranged for use on the next job. Double-rail tracks on each unit lock together and carry the traveling weigh hopper equipped with multiple-beam scale. Weigh hopper is adjustable to discharge from either side or either end. Write for bulletin.

GAR-BRO MANUFACTURING CO., 2416 East 16th Street, Los Angeles 21

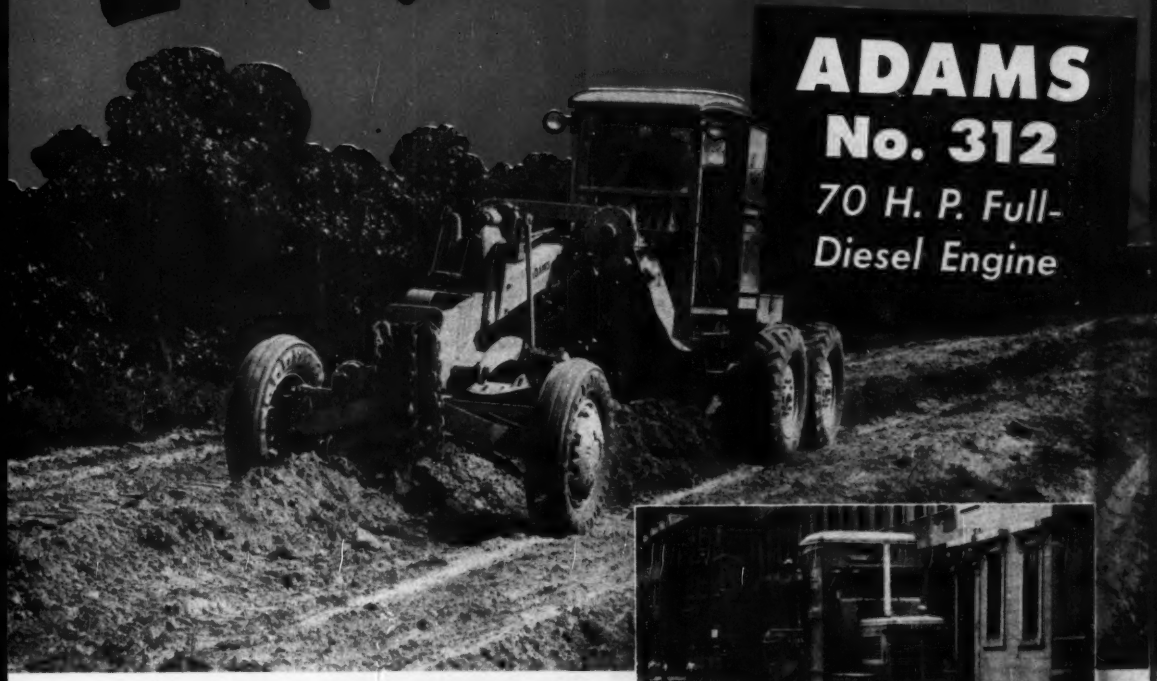


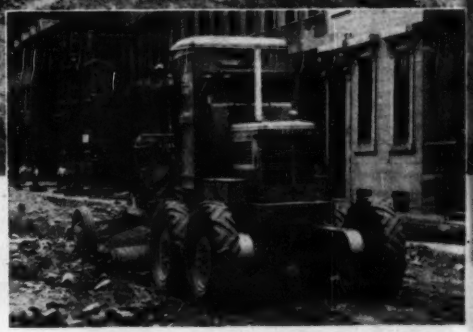
ASSEMBLE IN ANY COMBINATION

Hat Did the Trick

MINE SAFETY APPLIANCES CO. reports yet another incident which was prevented from becoming an accident by a worker wearing a protective hat. Louis D'Amico, boilermaker at Aliquippa Works of Jones & Laughlin Steel Corp., recently was on the receiving end of a drift pin which fell more than 30 ft from the top of a blast furnace. The heavy pin drove into the laminated plastic Skullgard but was stopped short of the wearer's head.

Look! A Medium-Priced Motor Grader with a lot of Capacity....





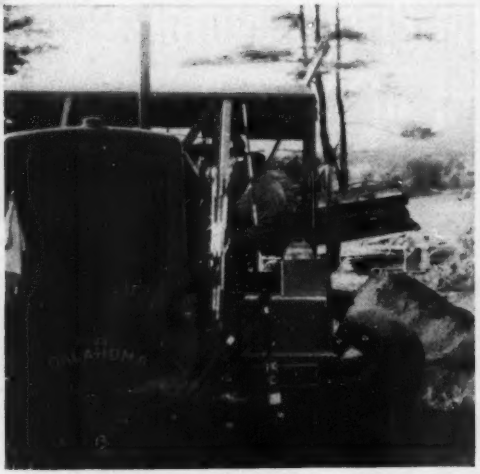
• The new Adams Motor Grader No. 312 is made to order for municipalities and contractors who are looking for a good utility machine at a moderate price.

Here is a husky 70 hp. motor grader with all of the weight and performance-ability that you bought in heavy-duty machines several years ago. From deep ditch cutting to high bank sloping—scarifying, sub-grading, fine finishing, mixing, back-filling, snow plowing, etc.—the new Adams No. 312 will do a surprising amount of work with real speed, efficiency and economy.

Before you buy any motor grader in the medium-price class, by all means investigate the great new Adams No. 312. See your local Adams dealer—or write for illustrated literature.

J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS, IND.

Make your next motor grader an **ADAMS**



1 FIRST PIECE of equipment following land-clearing crews is this Cleveland trencher. Note weighted striped guide bar which operator lines up with survey poles to assure straight-line trench.

2 TRIO OF INSLEY BACKHOES, with successively larger buckets and deeper bites, chew their way through rocky field bypassed by trencher. Each of three spreads has a million dollars worth of equipment.

Natural Gas Line Reaches New England

5 HEAVY RAINS don't deter welding crews who either doff shoes or wade right through. Internal line-up clamp similar to this one slid through 30 sections down mountain, was later retrieved.

FOR THE LAST LAP in the biggest relay race of the century, Northeastern Gas Transmission Co. recently took the baton from its parent company, Tennessee Gas Transmission Co. at the New York-Massachusetts border, and at the same time took the lead in a three-way 1,800-mi race to bring natural gas from Texas to New England. Authorized by the Federal Power Commission to do business in the six New England states, Northeastern is riding to completion behind the Oklahoma Contracting Co. This Dallas, Tex., outfit is carrying the line from a point south of Albany in a U-shaped swath (see map) across Massachusetts, and will later bring up a second line from Transcontinental Gas Pipe Line Corp. through western Connecticut, joining the first spread near Springfield, Mass.

Literally splitting Massachusetts into three parts at the start of NE operations, Northeastern and Oklahoma started three separate spreads: one southeast from the New York state line toward Springfield, a second northwest from Springfield to meet it, and a third eastward from Springfield through comparatively easier terrain to wind up the job in the outskirts of Metropolitan Boston. Into each of these spreads Oklahoma poured a million dollars worth of equipment and a bunch of seasoned pipeliners. Now there's a contest within a contest to see how quickly each group can complete its appointed run, wind the job up and finally go home.

The spread pictured here is a tough one, through the rugged Berkshire range with its steep slopes, unyielding granite formations, dense woodland and typically uncertain New England weather.

At one spot, east of Lenox, a backhoe was hung up with a pair of wire rope cables to two tractor winches anchored atop the mountain. The operators alternated every 2 hr, strapped into their seats,

3 MOVING IN immediately after blast, two more Insleys remove shattered Berkshire granite to clear way for bending crews. Here they start from opposite ends, work towards middle of trench.

and clawed their way safely down to the valley floor.

An auger crew has been kept busy boring under railroad tracks and main highways, installing casings and moving on to successive locations.

Blasting crews are experiencing something new in the stubborn, resistant granite formations. A Gardner-Denver 500 compressor, fitted with a double drill, ran along the right-of-way, leaving two parallel drill lines with holes on 3-, 4- and 5-in. centers, depending on the depth of trench needed. As soon as the dust settled after each blast a trio of Insley backhoes rushed in to clear the trench for layout and bending crews. Right on their heels came lining-up gangs with all kinds and types of welding machines and carriers. Next, in regular fashion came the wrapping gangs who clean, prime, dope and wrap the line all morning; drop it in and backfill it in the afternoon. The two spreads are working toward each other and closing the Albany-Springfield gap at a combined speed of about a mile a day despite the many obstacles.

Sections of pipe which cross secondary roads are laid out and completely treated near each crossing site, cut to exactly the right length. Later it's a simple matter to install—they dig a trench, place and weld the pipe, then backfill over it actually in a matter of minutes. Whenever a particularly swampy area is encountered, the same procedure holds; laying up a run of 7, 8 or 9 30-ft lengths on firm ground; then later picking it up and putting it in place with a fleet of side-boom tractors.

About 50% of the welds are X-rayed by Industrial X-ray Company of Tulsa, Seattle and Portland, Ore. In a self-contained Army 6x6 truck a two-man team travels the length of the pipeline. In residential areas, as well as at all road and stream crossings, *every* weld is X-rayed, and over a normal 2-mi stretch the machine checks the work of each welding team at least once, thus putting each and every welder under the daily careful scrutiny of an X-ray tube. Psychologically it produces more conscientious welding and less and less correction as the job progresses.

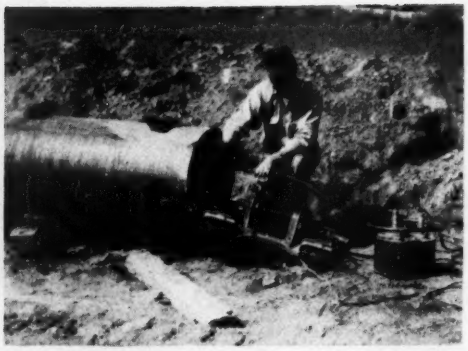
The picture-taking of welds is quite a simple proc-

4 SEEMINGLY BOTTOMLESS SWAMP is filled with logs, brought in by sideboom tractor. Only ends of previous loads are visible. Nine-length pipe section through swamp is readied on firm ground, then moved in.

6 "BOOM DOWN A HAIR" says line-up boss to operator on side-boom tractor, as welders prepare to seal up butt joint over swollen creek. Northeastern will have gas in by Labor Day.

(Continued on p. 84)

7 LOTS OF EQUIPMENT, such as these Lincoln welders, is mounted on pipe skids for easier movement through rough terrain. Note baffle of plywood between engines to prevent either one from overheating the other.

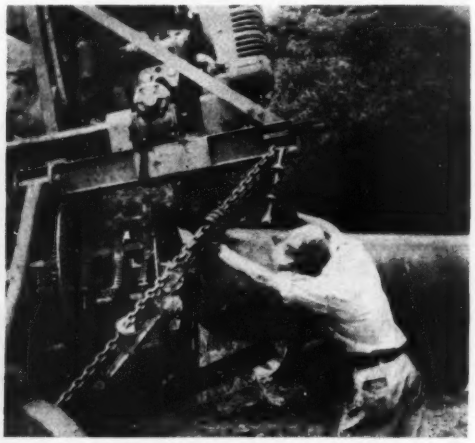


8 X-RAY TECHNICIAN inserts electric-motor-driven crawler in open end of pipe. Control panel (right) handles travel, timing, etc. Rig can travel through half a mile of pipe, or 88 lengths, dragging its own line.

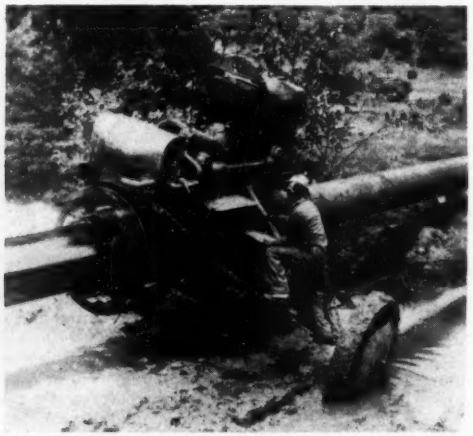
9 EMERGING FROM DARKROOM aboard truck, he examines film from weld picture taken 10 min earlier. Note other 7-ft film strips drying in sun and air. When all welds on a section are satisfactory . . .

ess: X-ray films come in 200-ft rolls, 4 in. wide. These are cut into 7-ft strips in a darkroom aboard the truck and inserted in lead-lined canvas envelopes. The inner lead strip is very thin, preventing exposure by the sun, but not strong enough to prevent a 2-min penetration of X-rays. The outer lead strip is a good deal thicker, however, and contains the rays within for proper exposure. It also prevents reflections of rays from nearby rocks, tools and machines, which would cause "ghosts" on the film and require the services of an expert to read them properly. Films clearly show the parent metal of the steel pipe as black and the pure weld metal as white. Therefore the heavier the weld, the more the white is evident. Black streaks and spots show even the tiniest of voids in the weld metal.

These canvas straps are laid over a series of butt welds and overlapping ends are clamped on top with a spring-type clothes pin. Lead numbers are laid on top of the pipe on the upstream end and inserted under the film, and an identifying number is burned into



10 . . . TAPERED-END CONNECTION is put over pipe to start cleaning machine. Sixty-four wire brushes, followed by canvas straps evenly spread enamel primer, quickly work their way along line.



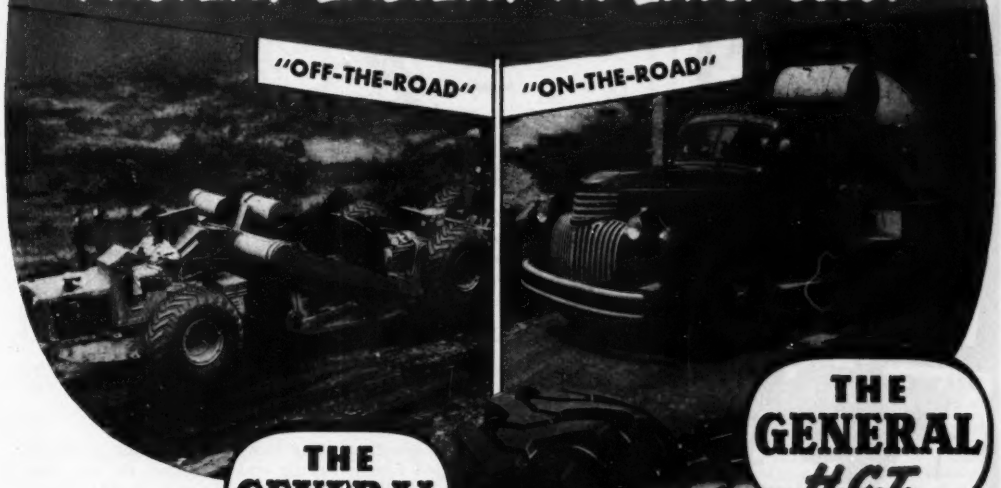
11 WITH STABILITY WHEEL dipping into waters of creek, end pipe hung up fore and aft to sideboom tractors, cleaning machine moves on steadily. Spreads are approaching each other at rate of 1 mi per day.

(Continued on page 86)

GENERALS

GO IN—GET THE LOAD—CARRY IT OUT AND OVER THE HIGHWAY

FASTER! EASIER! At Lower Cost!

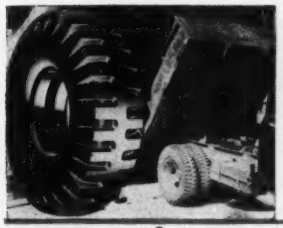


THE GENERAL D.T.L.

THE GENERAL H.C.T.

GENERAL D. T. L. with deep, sharp, angled cleats and sturdy, high shoulder lugs. Designed for maximum traction on soft surfaces—forward or backward.

GENERAL H. C. T. for trucks that go off-the-road to pick-up, deliver loads. Free-rolling tread and stronger body for more miles, more safety.



GENERAL NON-DIRECTIONAL CLEATED

Best for dump trucks. Self-cleaning tread for extra drive-wheel traction forward or backward.

GENERAL TRACTOR GRADER

For power wheels—sharp, self-cleaning tread for extra traction. For front wheels—easy steering, smooth riding ribs.

Specify GENERAL TIRES ON YOUR NEW EQUIPMENT

ROSCO
MINNEAPOLIS
ROAD and STREET CONSTRUCTION
and
MAINTENANCE EQUIPMENT

BITUMINOUS DISTRIBUTOR . . . Streakless application with pressure constantly and automatically maintained.

STREET FLUSHERS . . . Truck mounted or 2-wheel trailer type. Standard or custom built.

MAINTENANCE UNIT . . . For repair and secondary construction. Truck or trailer mounted.

STREET CLEANER . . . Settles dust as it cleans. Sweeps and washes the street.

OTHER ROSCO PRODUCTS: Road brooms—traction or powered tar kettles power pumping units.

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or write the factory for literature.

ROSCO TAR KETTLE

For heating and melting asphalt, pitch and all types of bituminous materials. Welded all-steel construction.

GENERAL LAYOUT of 1,800-mi natural gas pipeline from Texas-Louisiana area to New England with numerous compressor stations all along the way. Blown-up view at right

each negative. If any question arises later, the developed film is returned to its chalk-marked joint, the numbers are matched and the film rewrapped and clipped; then any faulty section is pin-pointed for corrective or completely new welding. With only 2 min needed for penetration, 3 min for developing, three more for washing and two for fixing, a film can be ready in 10 min for scrutiny. At a road crossing, for instance, all hands await the "O.K." from the X-ray man before they turn to and backfill the line in a hurry.

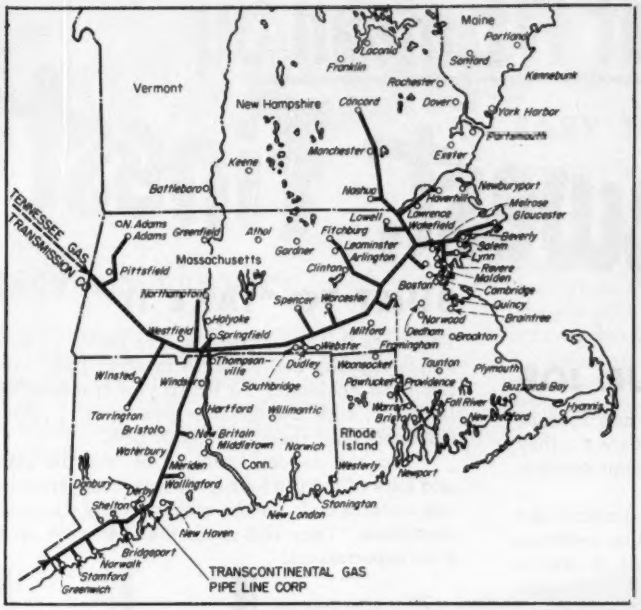
Delicate and Costly Tube

The large (and very expensive) X-ray tube itself is mounted on a rubber-shoed, motor-operated crawler which travels back or forth inside the pipe at the flip of a switch on a control panel. On this panel the X-ray man also has a timer, amp meter, control switch and trip light. This latter is flashed momentarily each time the tube passes under a butt weld, a telltale trip finger encountering the inside stringer bead, making an easy exact spotting of the tube every time. After setting the timer and waiting for a 2-min exposure, he moves the crawler on to the next joint and so on, up the line. The crawler will climb a 45-deg slope and can haul its own line through half a mile of pipe. Working from two ends, then, the X-ray duo need pipe breaks only once every mile.

To determine the exact location of the tube and carrier within the pipe, the operator places a mark at the end of the pipe for each joint passed and tested, with a yellow marking crayon.

Another electronic gadget which flawlessly checks the work of the pipeliners is a holiday detector. This consists of a large spring which is clamped around the pipe and rolled along just before the line is to be dropped into the ditch. Hooked up to batteries and red warning lights in a compact box, it flashes whenever a void is encountered in the final wrapping, even though it be but a pinhole. The workmen refer to these two gadgets jokingly as "snitchers" or "stool-pigeons" since they readily detect even the slightest flaw.

Northeastern expects to have the main 24-in. line complete as far as Boston and vicinity and gas flowing in it by Labor Day. As soon as right-of-way acquisitions are completed in sections of Connecticut they will bring up the second line from Transco (see

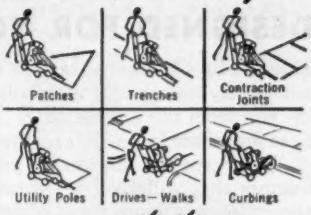


shows Northeastern Gas Transmission Co. spread through Massachusetts and Connecticut, which will wind up 3-yr job before the end of this year.

CONSTRUCTION METHODS AND EQUIPMENT, January, 1951, page 52) and wind up the 1,800-mi line. E. E. Miller, vice-president and chief engineer; and A. C. Poulk, construction superintendent, supervise the work for Northeastern. T. A. Hester, president of Oklahoma Contracting Co., handles their problems in Dallas, and his top spread boss is Paul Helbert, vice-president. Pittsfield and Westfield spread bosses under him are Red Wiley and Amos Kilgore.

12 WRAPPING MACHINE brings up tail end of procession, covering pipe with hot enamel, then wrapping in overlapping layers of glass wool (.015 in. thick) and Johns-Manville Tar Saturated Asbestos pipeline Felt. Electronic holiday detector makes final check before pipe is lowered for backfill.

Save by Sawing...



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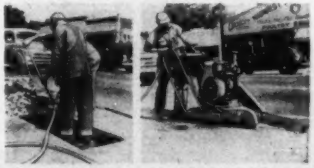

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HD-9

72 drawbar hp., 18,800 lb.

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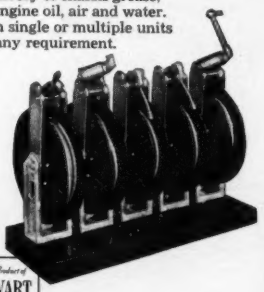

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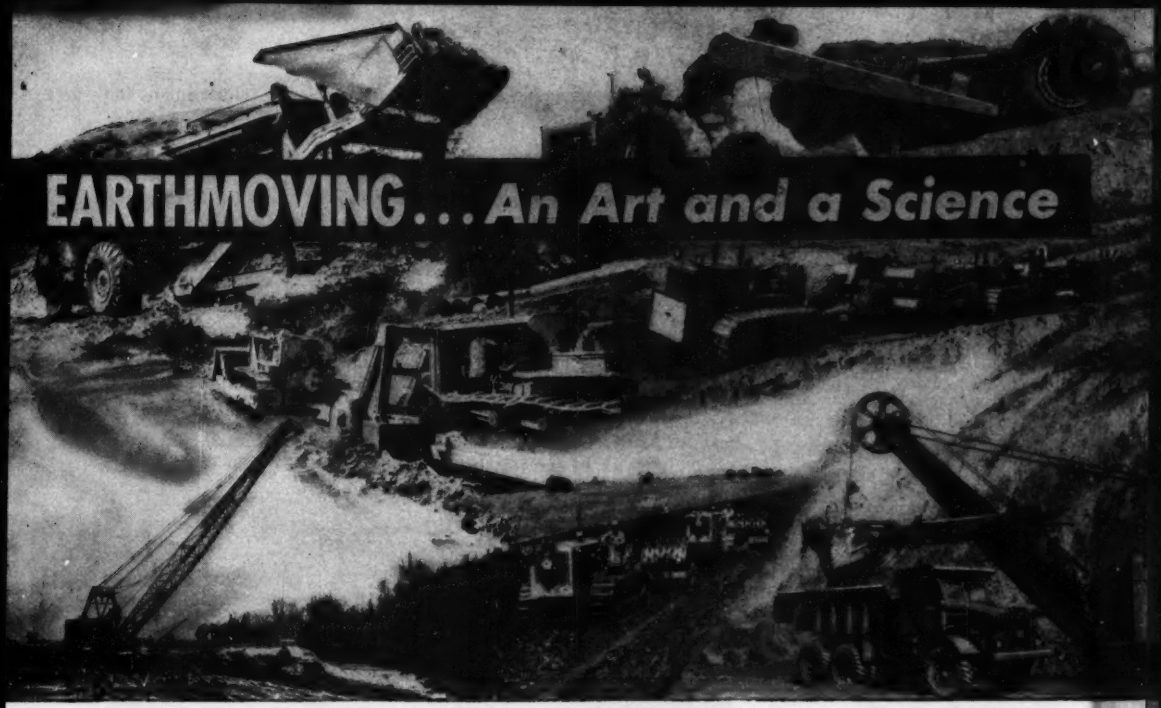


9. Stabilization of Embankments

By DAN K. HEIPLE, Chief Field Engineer, R. G. LeTourneau, Inc., Peoria, Ill.

This is the ninth of a series of articles on the fundamental principles of earthmoving. Sections on earthmoving history, job analysis, equipment selection, ownership and operating costs, factors affecting production, production and cost estimates, application of bulldozers, scrapers and rippers, and maintenance and repair have already been published in our last eight issues. Still to come are comprehensive articles on the selection, application and costs of other types of earthmoving equipment including shovels, hoes and draglines.—THE EDITOR.

STABILIZING FILLS or rock and earth requires compaction to eliminate voids, bringing individual particles into close enough contact to increase internal friction, cohesion or both. The degree of compaction is determined by the strength required to resist expected deforming loads, the elimination of infiltrating water which might weaken the structure, and the possibility of frost heaving.

Soils are classified as to acceptability for a construction material, compaction requirements are ascertained, and field control data is established in the soils laboratory. This work requires the services of soils experts, and detailed methods will not be discussed here. Some tests are more complete than others, especially when construction requirements are critical, but most will include:

1. A sieve analysis to determine, percentage-wise, the distribution of grain size.

2. Natural moisture content as well as plastic limit and liquid limit. All are expressed as a percentage of water by weight to the weight of dry soil.

a. Plastic limit is the lowest percentage of water that will allow rolling a sample to ⅛-in. dia without crumbling. For all practical purposes it does not exist in non-cohesive soils. As the name implies, it is the point where a soil is changing in characteristic from solid to plastic.
b. Liquid limit, also indicated by the name, is the lowest moisture content at which the soil tends to flow when disturbed slightly; the change from plastic to liquid.
c. The difference between the plastic and liquid limits is called the plasticity index. Generally speaking, a low index indicates good compacting qualities, and for non-plastic soils is zero.

3. Determination of natural density and a compaction test to discover optimum moisture. Optimum moisture is the percentage by weight of water at which maximum density can be obtained on a sample by a prescribed compacting procedure. It will, therefore, vary with the method used.

General procedure is to specify the size, weight, height of drop and number of blows to be delivered by a tamper to a confined sample, and then to measure the resulting density both wet and dry. The process is repeated, varying the water content, until the highest density is recorded for the method. The moisture content of the wet sample corresponding to highest density of the dry sample is optimum. Some special variations in method may

exist but the most common prescribed is the AASHO modified. (American Association of State Highway Officials.)

4. Load carrying capacity or bearing ratio. This test is a percentage comparison of loads required to force penetration of a piston an equal distance into the sample being tested as against a specified standard. The common measure is known as the California Bearing Ratio (CBR), for which the standard of comparison is a compacted crushed stone.

Laboratory methods are well defined and generally agreed upon. Duplication of laboratory densities in the field, however, is seldom a simple matter, and as a result there is considerable difference of opinion as to proper equipment and methods. When the end result is specified, it is given as a percentage obtained by dividing field density by laboratory density—for instance 95%. Although density requirements are usually stated, the type and amount of rolling are also most often prescribed, with extra passes of the compacting equipment called for at the direction of the engineer.

Sheepsfoot Rollers

The sheepsfoot roller is by far the most common compacting tool, although rubber-tired and vibrating tampers are sometimes used. There is considerable variation in requirements as to the typical dimensions of the drum, foot area and length, number of feet, and ground pressure. However, new highway, dam, and airport work currently leans toward big, heavy units with ground pressures of 600 to 1,000 psi.

Big units have several advantages in addition to making higher densities possible:

1. They will give the same density as smaller rollers at a lower moisture content, making it possible to roll on the dry side of optimum where moisture may have some adverse effects in the completed structure.

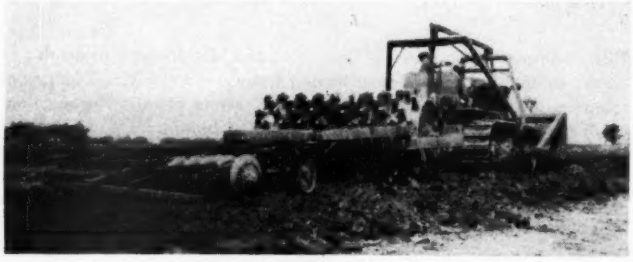
2. Bigger foot area gives better coverage, and with more weight can obtain the same compaction with fewer passes. On high-production work this is an important factor in avoiding holdups in the placement of material while small rollers make extra passes or create a traffic problem by cluttering up the fill with a greater number of units.

Over-compacting is possible, however, and big rollers should have some provision for varying the compacting pressure.

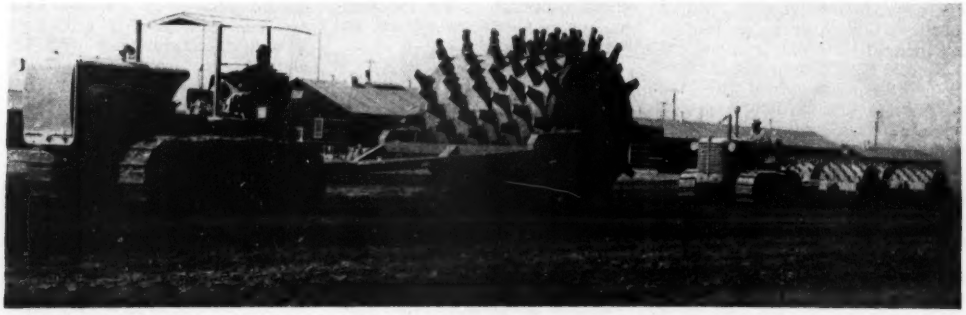
•

1. Over-stressing rather than over-compacting perhaps better describes the condition where the roller refuses to "walk out" to any appreciable degree. When this occurs, the roller is continually shearing and displacing the soil rather than compacting it. Moisture content may sometimes be too high for any compaction at all, but there have been instances recorded

SHEEPSFOOT ROLLERS with external ballast boxes and provision for internal drum loading have a wide range of foot pressures to meet various soil and compaction conditions.

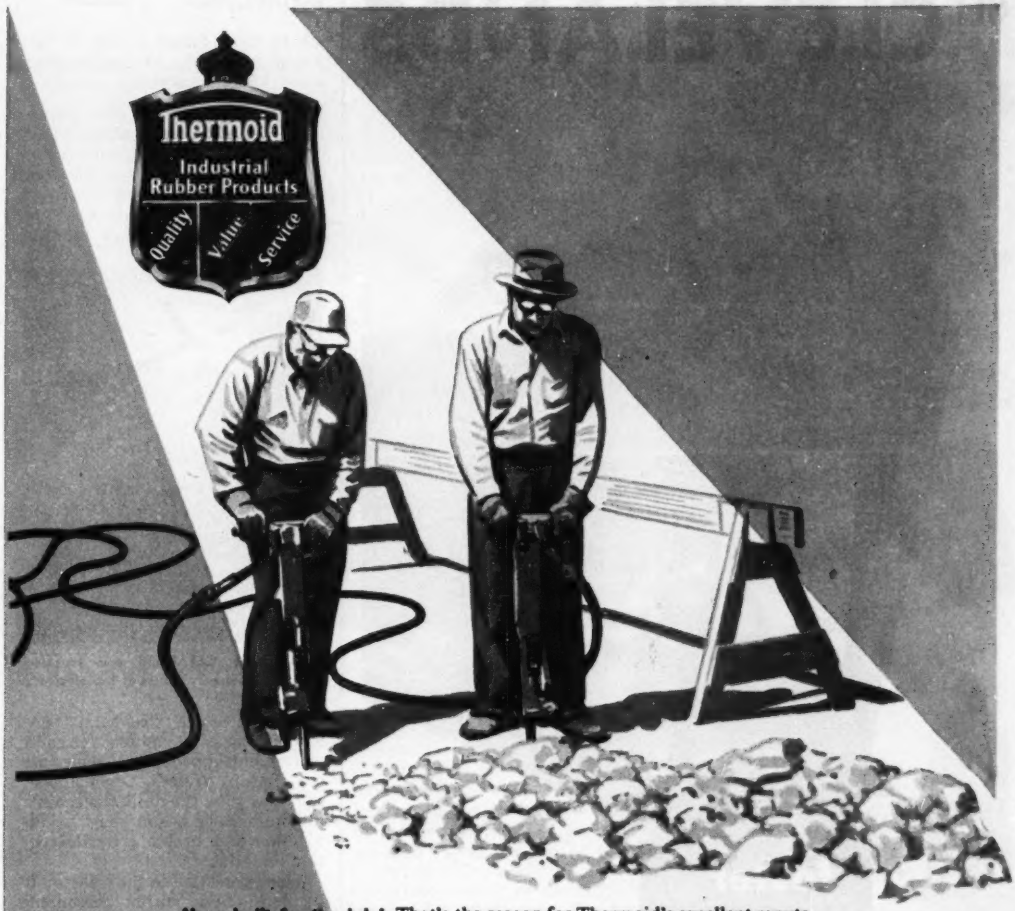


DISK HARROW will break clods or loosen top of compacted lift for bond with next one.



GIANT SHEEPSFOOT (75,000-lb. 8x10-ft drum) develops 1,000 psi to compact airport sub-soil and subgrade. Standard units follow.

(Continued on p. 94)



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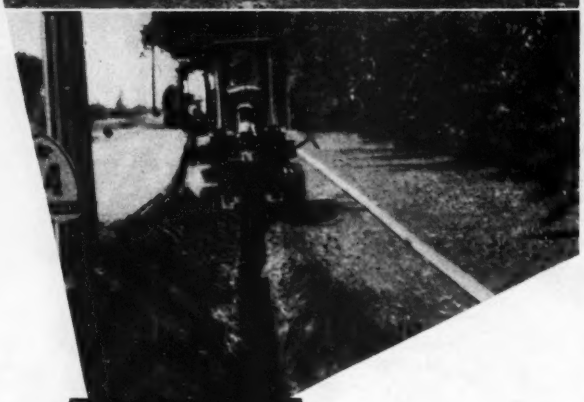

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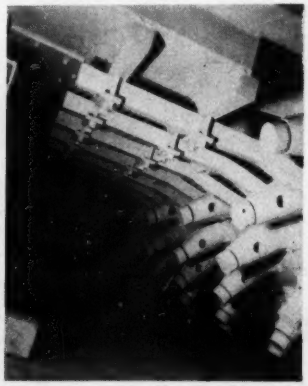
where light initial pressures followed by rolling at higher pressures gave satisfactory results.

2. Some soils with marginal stability may be impacted an increased density beyond a given point without being compacted in the true sense of the word. The density is actually only temporary since too heavy a roller can create internal



ADJUSTABLE CLEANERS and knock-out foot pads help keep rollers at top efficiency.

pressures which "rebound" unequally, causing failure. Organic matter, entrapped air and water are contributing factors. Less compaction may give the desired strength, although such a soil may be altogether undesirable as a construction material.

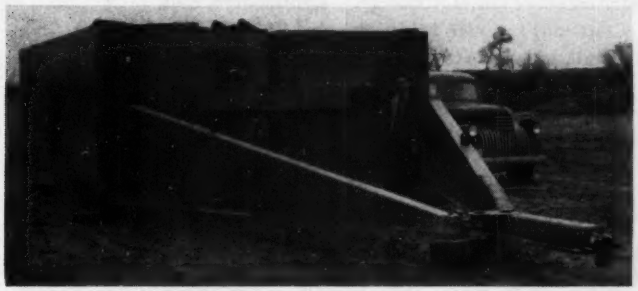
Were density the only factor to be considered, within reasonable limits, it should be possible to get the same compaction with almost any roller by varying the method; that is, by making a shallower lift, allowing higher moisture, or increasing the number of passes, a small roller might be used to obtain the same specified results as a larger one rolling on the dry side, in deeper lifts, or making fewer passes.

A sheepsfoot roller seldom walks completely out, but usually leaves the top 2 to 5 in. in a loose layer which is compacted at the bottom of the next lift. Where the roller does walk out completely it may be necessary to disk the surface to maintain a good bond between lifts.

Other Compacting Equipment

In non-cohesive sands and gravels, the sheepsfoot is sometimes ineffective where rubber-tired roll-

RUBBER-TIRED ROLLER successfully compacts non-cohesive soils, here sand. Body of 13-wheel unit is weighted with slag, and wheels wobble to give better compacting action.



HUGE COMPACTOR rides on four pneumatic tires, weighs 200 tons fully ballasted with pig iron. Like giant sheepsfoot, it compacts subsoil without removal and replacement.

ers have been used successfully. The larger contact area of the tire gives greatly increased coverage and tends to confine and compact the soil under the tire rather than displace it. Relatively high tire pressures are required since the ground contact pressure is dependent on tire pressure and is independent of the load in the working range of the tire. Greater gross loads simply deflect the tire to greater ground contact at the same ground pressure. These rollers do offer the advantage of quickly varied contact pressure by changing tire pressure in the working range, but have not proved as satisfactory for as many types of work as the sheepsfoot.

The relatively new grid roller appears to have some of the advantages of both rubber tires and sheepsfoots, although in the bulk of work it is still a comparatively unknown quantity. The same is apparently true of vibratory types. However, both represent a new approach to an old problem, and could develop into some entirely different techniques.

Compaction of the subgrade in place, without first excavating and replacing in rolled lifts, has also been the subject of testing. Super compactors—giant sheepsfoot rollers with feet as long as 18 in., and rubber-tired units of tremendous weight—have been tried. The units are difficult to handle with available tractive power but do give increased density to a considerable depth. The big rubber-tired rollers may also locate pockets or lenses of undesirable material, which should be removed, by causing subsidence of a small area. The surface is disturbed, especially by the big sheepsfoot, and calls for stage rolling by a lighter roller to complete the job.

Judicious routing of rubber-tired equipment on the fill is a definite aid to compaction, and can be used to seal the last few inches behind the sheepsfoot roller.

Generally speaking, all compacting effort rapidly approaches a point of diminishing return, the last 2 or 3% of required density involving considerable effort and expense. For instance, rubber-tired hauling equipment alone, in its normal travel, may give as high as 80 to 85% of laboratory compaction. Eight passes with a heavy sheepsfoot might reasonably raise this to 95%. An additional 12 passes might be required to raise this figure again to 97 or 98%. The last 2 or 3% might be physically im-

(Continued on page 96)

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OPEN TYPE
DIFFERENTIAL-ACTING
PILE HAMMERS
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possible in the field with available equipment, or absolutely prohibitive in time and money. These figures do not represent any actual soil condition, except by chance, although it is felt that they illustrate a reasonable possibility. The point is that compaction resembles a football game in which the first 90 yd are necessary to put you in position to score, but in which the last ten are the tough ones presenting the real problem, and requiring the maximum effort.

Compaction Rate

If rolling is not to interfere with production schedules, a rate must be established in cu yd compacted per hr and applied to over-all production schedules to insure enough tampers for the job. Where frequent turns are made, or restricted areas require maneuvering, these factors must be considered and the figures adjusted accordingly.

However, a quick estimate can be made with the logical formula:

$$\text{Cu Yd Compacted Per Hr} = \frac{\frac{\text{MPH} \times 5{,}280 \times W \times D \times F_s}{P \times 27}}{12}$$

Where

- MPH = Speed of towing tractor.
- 5,280 = Ft in one mi.
- W = Width of roller or combination of rollers, in ft.
- D = Depth of lift in in. (÷ 12 = depth in ft).
- F_s = Percentage factor of pay yd to loose yd.
- P = Number of passes required.
- 27 = Cu ft per cu yd.

Then rolling 12 passes on 6-in. lifts at 2.5 mph with a double-drum unit 10 ft wide in a soil giving 80% of pay yd to loose would give:

$$\frac{\frac{2.5 \times 5{,}280 \times 10 \times 6 \times 0.8}{12 \times 27}}{12} = 163 \text{ cu yd per hr}$$

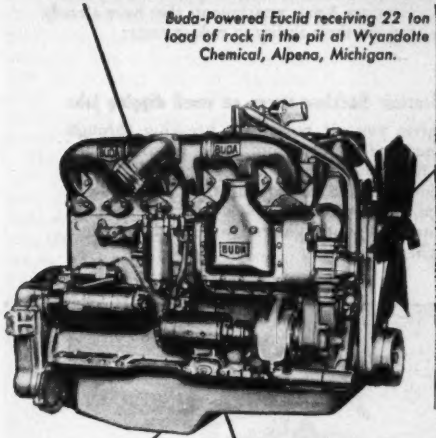
Normal job efficiency would also apply. Thus if a 50-min hr is being realized, the figure would become 83%x163=135 cu yd per hr.

If compaction is not taking place in the turns, an estimate of time spent here must also be made. On short work, 10% of the time could be consumed in turns, causing a further adjustment of 90%x135= 121 cu yd per hr.

Thus an hourly production schedule of 550 cu yd would require five (actually 4.55) of these double-drum rollers to keep ahead of the hauling.

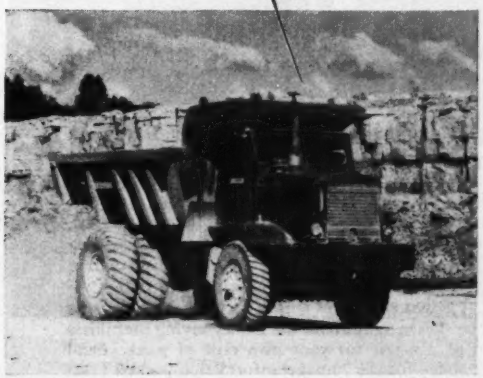
Some contracts indicate the number of rollers of a given type that must be kept on the fill for each specified multiple of production or fraction thereof.

14 BUDA SUPER Diesel-Powered "EUCS" Average 16 hrs. per day for 4 Years* *WITHOUT MAJOR OVERHAULS!*



Buda-Powered Euclid receiving 22 ton load of rock in the pit at Wyandotte Chemical, Alpena, Michigan.

The Buda 844 Super Diesels powering Wyandotte Chemical Company's 14 Model TD-14 Euclid trucks averaged 17,280 hours of operation over a 4 year period without major overhaul.



Buda Diesels provide high travel speeds for faster round trips.

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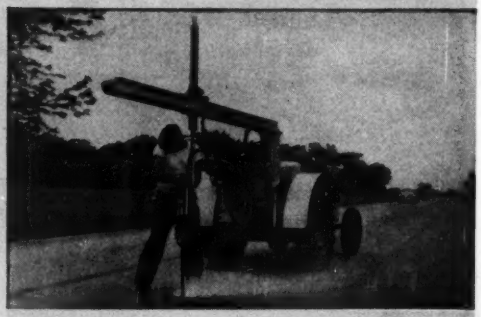
Tractair with its combination tractor-105 compressor feature and its many attachments has provided money-saving usefulness for contractors, utilities, and municipalities everywhere. Here are 3 new attachments that have already proved their ability to reduce costs:

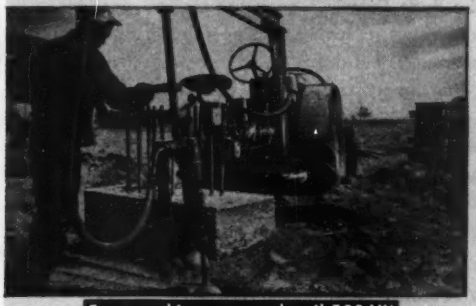
1 Tractair Backhoe saves on small digging jobs

It gives you air power for breaking through pavement, frost, or running other air tools. Then the hydraulic backhoe takes over — does your digging fast and easy to a depth of 8 feet. Plenty of power for roots, broken concrete or hard ground. Digs straight end walls and loads to a height of 6'2".



2 Tractair Patch-Drill saves on pavement patching and trench opening

This unit consists of an air-feed Le Roi-CLEVELAND H-10 sinker (45 lb). It permits easy, fast drilling of a succession of holes. Then, using the same machine, all you have to do is broach out the web between the holes and lift out the entire section of pavement. There is no loading problem — no shoveling. Holes can be drilled and broached in an 8' radius. Tractair supplies air power, mobility, and, when equipped with front-end loader attachment, lifting power, too.



3 Tractair Multiple Tamper saves on tamping operations

Thanks to Tractair mobility, the tamping effectiveness of the Le Roi-CLEVELAND 3-Tamper arrangement and work-saving air feed, this unit can keep up with three men shoveling or a back-filling tractor. Not only is tamping faster and easier, but you also get better compaction and lower costs.

Learn more about the money-saving usefulness of Tractair for your own type of work. Send today for the 70-page, information-packed Tractair application book.

Tear out this coupon and mail TODAY!

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Dept. CM-9, 1768 So. 68th Street, Milwaukee 14, Wisconsin

I want to know more about Tractair's ability to cut costs. Please send me your new 70-page Tractair Application Book.

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Company.....

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City..... (.....) State.....

Y-10

LE ROI COMPANY

MILWAUKEE 14, WISCONSIN

Plants: Milwaukee • Cleveland • Greenwich, Ohio

CEMENT SACKS

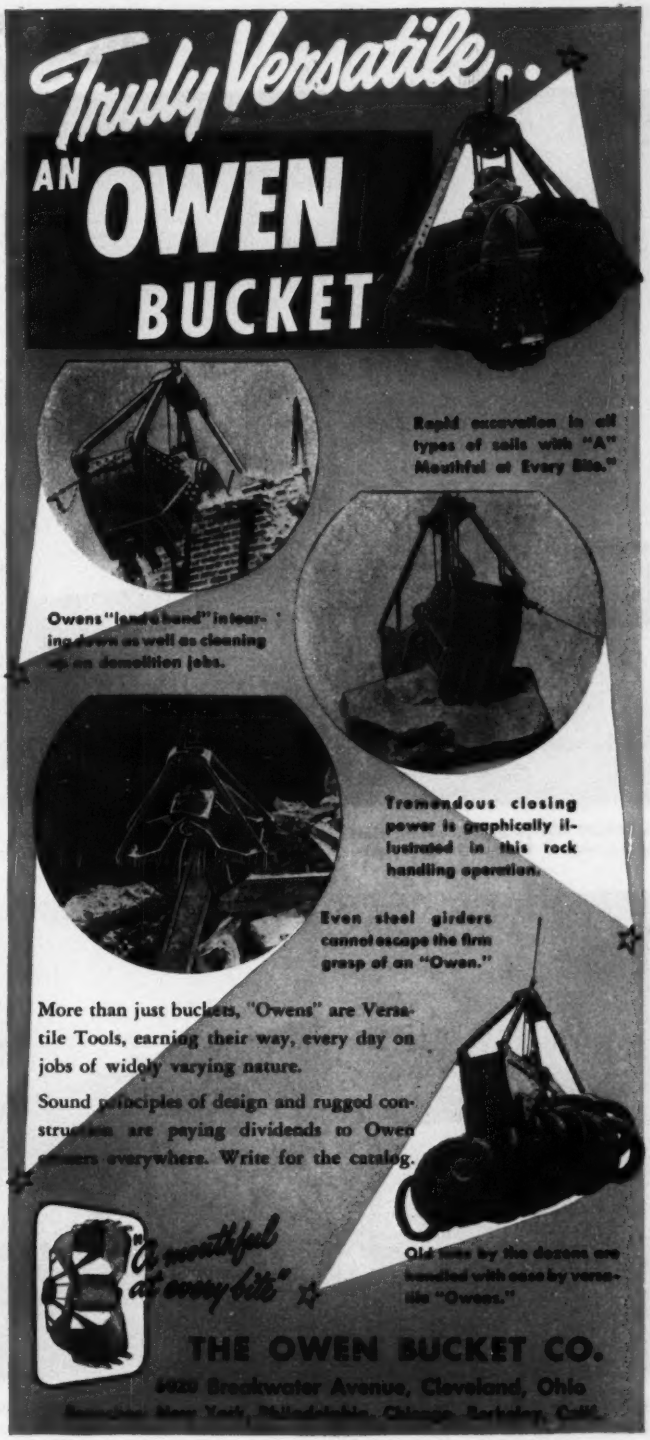
(*Continued from page 59*)

intervals, bags move across two circular saws that rip them open at the rate of 23 per min. The opened sacks pass onto a vibrating chain—the part reclaimed from a potato digging machine where its normal function is to shake the sod off of those good Idaho spuds after they have been yanked from the fields. The bouncing trip across this potato shaker empties the bags' contents into a hopper that feeds into the storage silos of the concrete mixing plant. The empty paper sacks are carried by belt directly into an incinerator.

The men behind the idea, with the support of Project Manager Glenn Johnson, were Jim Rutherford, concrete superintendent, Murray Johnson, plant installation engineer, Ray E. Willis ironworker foreman, Frank Stopka, millwright, and Boyd Christensen, chief of party.—From the *Em-Kayan*

It's Footwork for Him

WILLIAM B. KIRK, Kermit, W. Va., contractor, operates a tractor himself, in spite of being handicapped by the loss of an arm 9 yr ago. He was convinced that he could operate a tractor and bulldozer with his feet—through pedal-operated controls normally handled manually—and had a tractor rigged to order. Here he is building a tramroad for a new coal mining operation in his native state with his International TD-14 crawler and Bucyrus-Erie dozer.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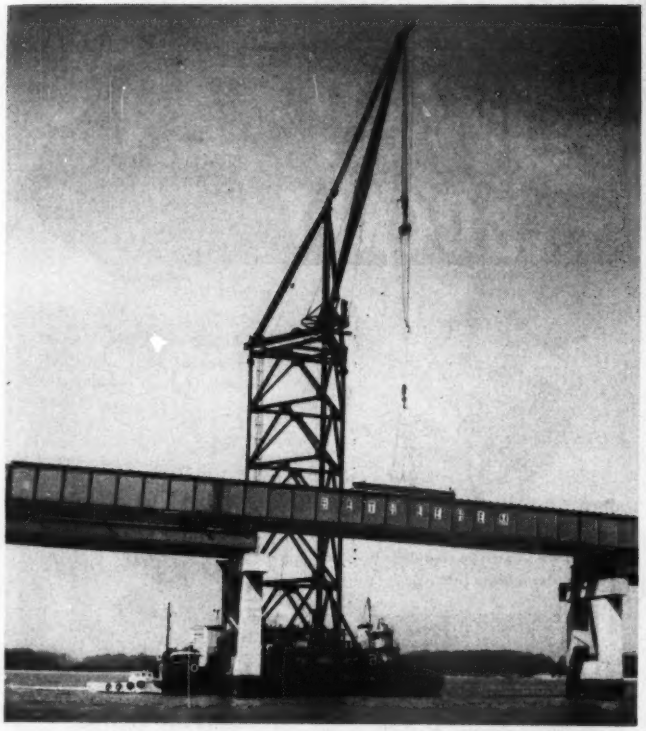
Owens "land a hand" in tearing down as well as cleaning up on demolition jobs.
Tremendous closing power is graphically illustrated in this rock handling operation.
Even steel girders cannot escape the firm grasp of an "Owen."
More than just buckets, "Owens" are Versatile Tools, earning their way, every day on jobs of widely varying nature.
Sound principles of design and rugged construction are paying dividends to Owen owners everywhere. Write for the catalog.
"A mouthful at every bite"
Old cars by the dozens are handled with ease by versatile "Owens."
THE OWEN BUCKET CO.
5020 Breakwater Avenue, Cleveland, Ohio

Barges Place Girder Spans



MONSTER TOWER DERRICK BOAT places final bracing in 200-ft girder span for bridge 25 mi south of Baltimore. Assembly takes place atop previously erected shorter spans.

NOT CONTENT with floating just 19 big trusses into place for Maryland's Chesapeake Bay Bridge (CONSTRUCTION METHODS AND EQUIPMENT, February, 1951), Bethlehem Steel Co. is also setting seven 200-ft girder spans by somewhat similar means. The long spans are assembled on shorter, completed girder spans, then are picked up and moved into position in the 4-mi crossing by the same flotation barges that handle the trusses. It's a neat trick that minimizes the falsework and floating equipment required.

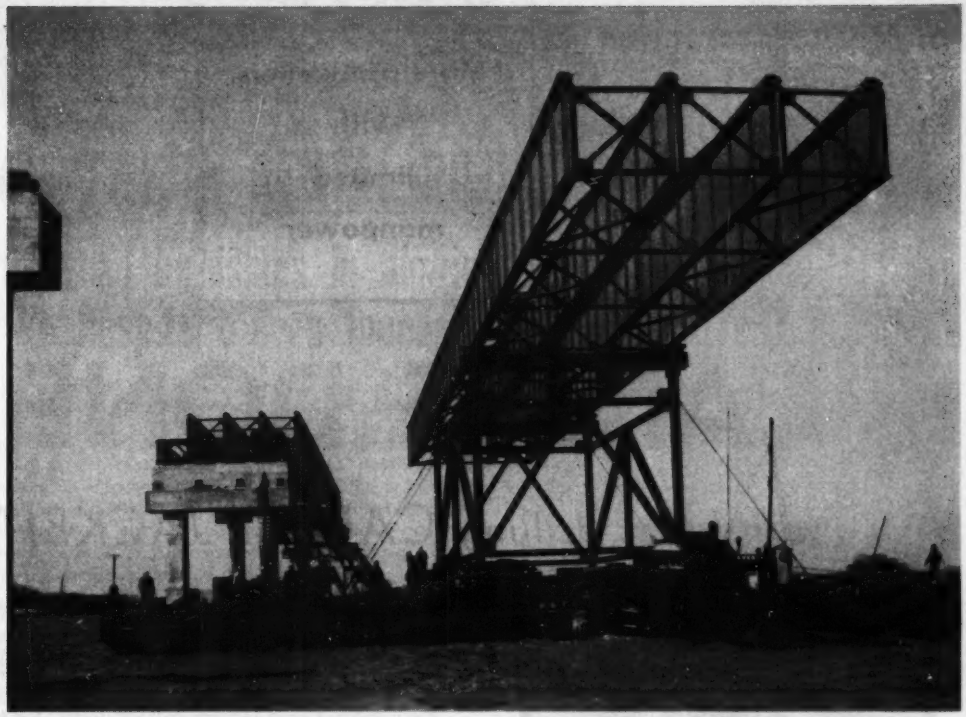
The 200-ft spans weigh 250-tons each. They consist of four parallel, cross-braced girders 9 ft deep, with each girder made up of a fabricated 100-ft center section and two 50-ft ends. Assembly takes place nearly ½ mi out in the bay, where completed bridge superstructure is a series of 100-ft spans. Two alternate 100-ft spans have been temporarily omitted, and it is across these gaps that the 200-ft spans are assembled so they can be picked up by barges floated beneath. The two openings let work proceed simultaneously on two of the long spans.

A 40-ton floating derrick erects the 200-ft spans. First, 50-ft sections for one end are assembled on a 100-ft span so that they project

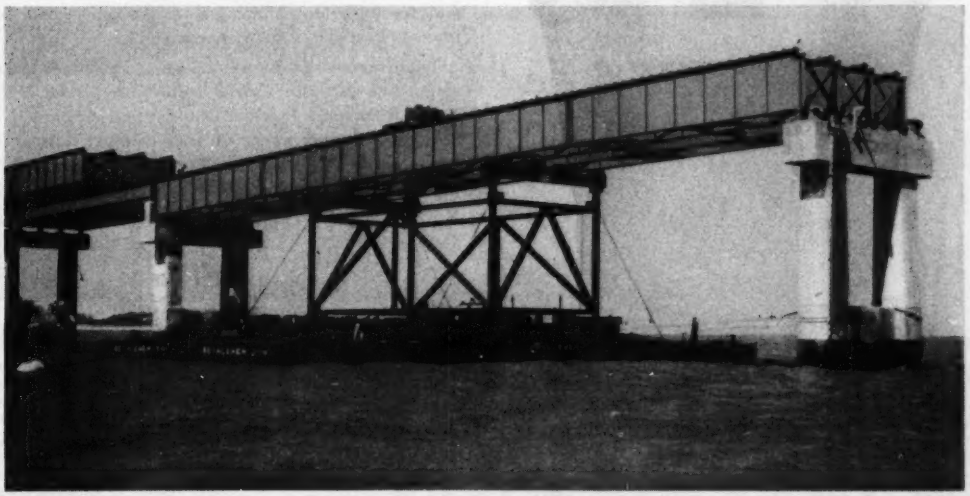
(*Continued on page* 104)

AT ERECTION SITE ½ mi from shore, flotation barges maneuver beneath span to pick it up and move it to final location farther out in 21,286-ft bridge. During erection of shorter spans on which long one is erected, gap was left so barges can make lift.

in Chesapeake Bay Bridge



LONG, HEAVY GIRDER SPAN balances on top of 40-ft falsework tower on barges as they are moved by tug. Piers for this 200-ft, 250-ton span are at extreme left. In background, second of seven similar spans nears completion, to be moved in like manner.



AT FINAL LOCATION, span 9 ft deep is lowered on to bridge seats by flooding barges' compartments after anchor and mooring lines have jockeyed floating assembly into exact position. Span was erected at same grade and elevation as its final position.

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These advantages all add up to a tremendous increase in footage per shift—*without increasing your drilling crews.* Remember Ingersoll-Rand offers a complete line of equipment and service for rock drilling. Take advantage of our highly trained and skilled personnel. There is an Ingersoll-Rand branch office and distributor near you. Write or call today.

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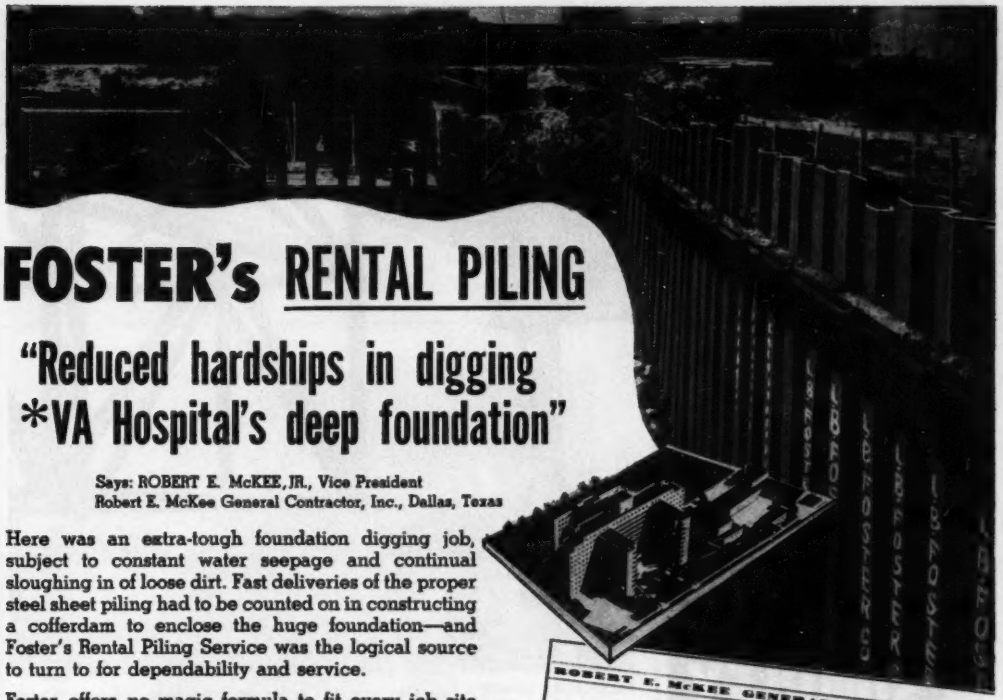


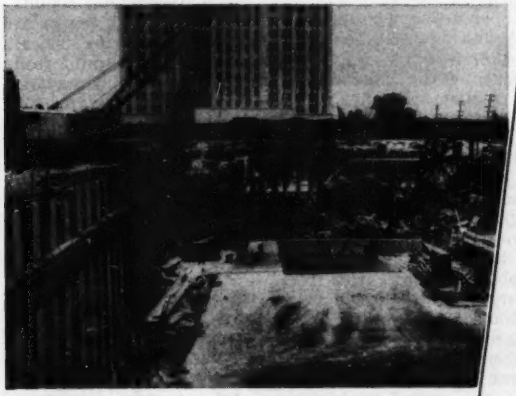
FOSTER's RENTAL PILING

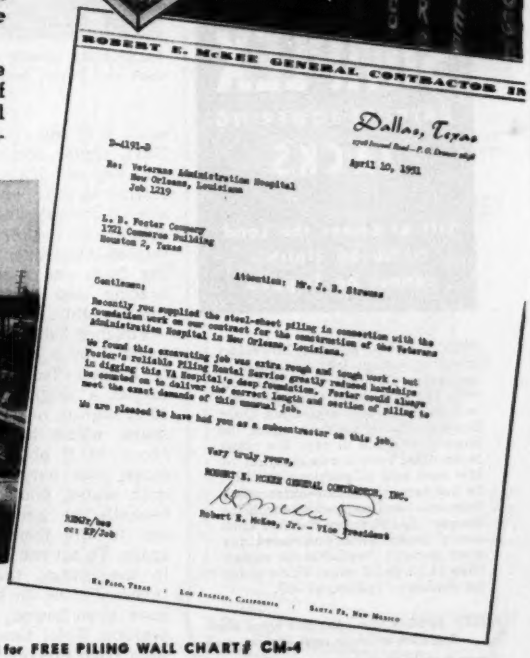
"Reduced hardships in digging *VA Hospital's deep foundation"

Says: ROBERT E. McKEE, JR., Vice President
Robert E. McKee General Contractor, Inc., Dallas, Texas

Here was an extra-tough foundation digging job, subject to constant water seepage and continual sloughing in of loose dirt. Fast deliveries of the proper steel sheet piling had to be counted on in constructing a cofferdam to enclose the huge foundation—and Foster's Rental Piling Service was the logical source to turn to for dependability and service.

Foster offers no magic formula to fit every job site . . . but a complete warehouse stock consisting of every length and every section of interlocking steel sheet piling in every standard make—always available for prompt shipment.





ROBERT E. McKEE GENERAL CONTRACTOR IN

Dallas, Texas

D-1191-D

April 10, 1951

Re: Veterans Administration Hospital
New Orleans, Louisiana
Job 1219

L. B. Foster Company
1721 Commerce Building
Houston 2, Texas

Attention: Mr. J. B. Strauss

Gentlemen:

Recently you supplied the steel-sheet piling in connection with the foundation work on our contract for the construction of the Veterans Administration Hospital in New Orleans, Louisiana.

We found this excavating job was extra rough and tough work - but Foster's reliable Piling Rental Service greatly reduced hardships in digging this VA Hospital's deep foundation. Foster could always be counted on to deliver the correct length and section of piling to meet the exact demands of this unusual job.

We are pleased to have had you as a subcontractor on this job.

Very truly yours,

ROBERT E. McKEE GENERAL CONTRACTOR, INC.

Robert E. McKee, Jr. - Vice President

REMJr/hwe
cc: EP/Job

El Paso, Texas | Los Angeles, California | Santa Fe, New Mexico

*The New Orleans Veterans Administration Hospital being constructed by the New Orleans, District of the Corps of Engineers under District Engineer Col. Chas. G. Holle. Favrot, Reed, Mathes & Bergman of New Orleans and Faulkner, Kingsbury & Stenhouse of Washington, D.C. are the architects.

This new 10-story VA hospital is being built at a cost of approximately $9,000,000. Work got under way in September 1949 and is scheduled for completion sometime in January 1952.

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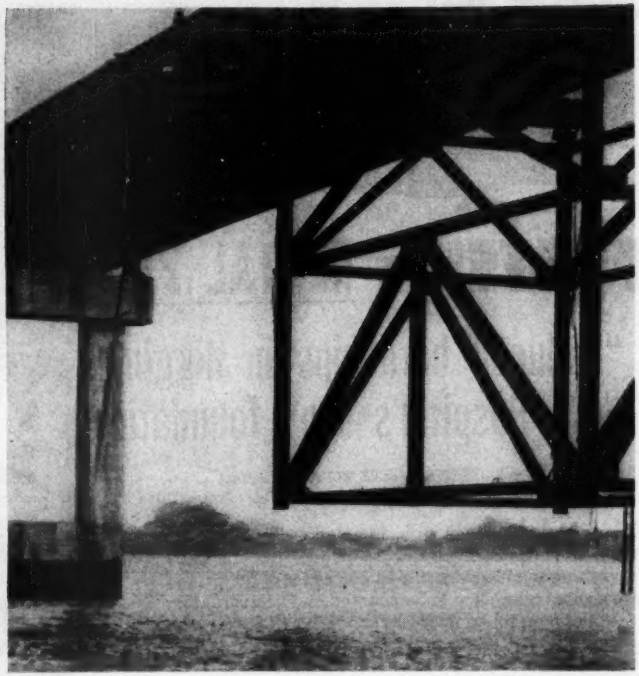


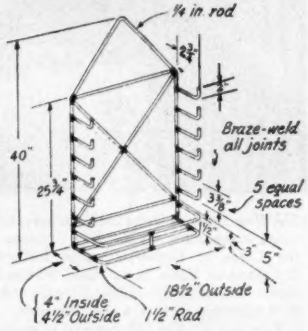
FALSEWORK TOWER is parked between uses by leaving it bolted to underside of girder span, thus freeing flotation barges for other work. Tower members are 14-in. WF beams.

some 6 ft into the adjacent gap. Next, center sections are placed, with one end of these 100-ft pieces resting on the span at the opposite side of the gap and the other end spliced to the first-placed 50-ft section. Attachment of the remaining 50-ft end section, plus final bracing and riveting, completes the assembly.

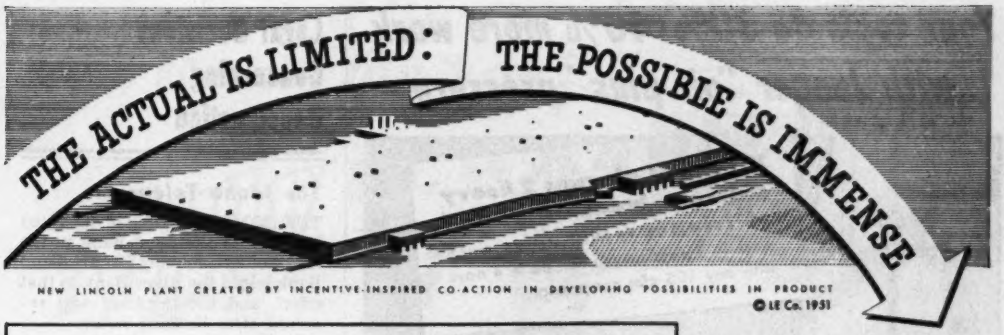
Finished 200-ft spans are floated to place by a pair of 32x9½x128-ft barges. This barge assembly carries a single falsework tower 40 ft high in order to pick up the spans, whose bottom flanges are about 50 ft above water. For a move, the barges are ballasted with water, floated into the gap beneath the girders and pumped out to lift themselves and the spans. To set the span on its seats in the bridge, the procedure is reversed after the barges and load have been towed and spotted in position. Total time for shifting a span from erection site to permanent location is 4 hr.

Seven spans are being assembled and placed by Bethlehem in this manner. The method's principal advantage is that use of the shorter spans as an erection base eliminates driven falsework and much floating equipment. Another wrinkle: To free the flotation barges for other erection going on simultaneously, the falsework towers are bolted and left hanging beneath the span just placed, until ready for use on the next, thus providing storage space not readily available out in the bay.

WELDING ROD RACK



A RACK of this type is useful in any welding shop. It can be hung on the wall, easy to reach yet out of the way, and will hold five cans of flux and six different sizes or types of welding rod.—From Linde "Tips", July 1951



NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

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SAVES 14% CONSTRUCTION COST OF HIGHWAY BRIDGE

By **Ned L. Ashton**
Consulting Engineer
Iowa City, Iowa

UTILIZING the economies of welded structural design has saved an estimated $27,000 or 22% in the cost of fabricating and erecting steel work for Iowa City's new highway bridge. 80 tons of steel have also been saved through simpler details and complete elimination of butt plates and rivets. The finished structure is cleaner in appearance, is easier and less costly to maintain.

In erection, girders are bolted in place and field welded. Sidewalks and handrails are entirely shop fabricated by welding and then field welded as complete units to girders with Lincoln "Fleetweld 5" and "Shield-Arc" welders. The 528 man-hours field welding time required was completed at subcontract cost of only $4100.

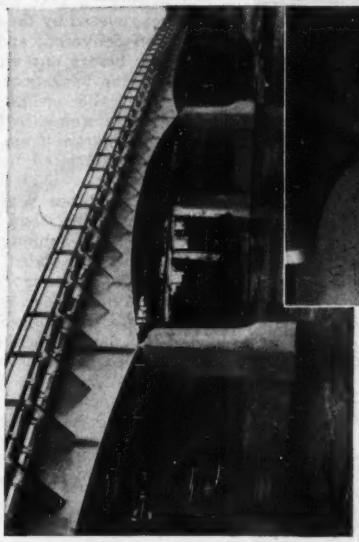

Fig. 3. Modern Steel Deck Girder Highway Bridge *for Iowa City, Iowa is 480 feet long and carries 2 lanes of traffic. Inset shows simple details of sidewalk cantilever support and rocker shoe. General Contractor: Jensen Construction Co., Des Moines, Iowa. Welding subcontractor: Teleweld Corporation, Chicago, Ill.*

simpler field splices

Fig. 1. Joint on Center Girder Section. *Field splices made without aid of auxiliary splice plates attain 100% strength of girder. Clips are used for bolted erection only.*

faster, lower cost fabrication

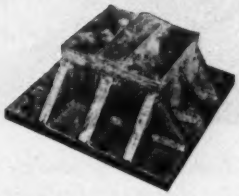

Fig. 2. Fixed Bridge Shoe *supports load of 453,000 pounds on hardened steel line bearing surface 17 inches long. Weld-fabricated at low cost from 2" steel plate.*

SPEEDS CONSTRUCTION OF NEW HIGHWAY BRIDGE

Studies in Structural Arc Welding, describing above bridge, are available to engineers and designers. Write on your letterhead to Dept. 175,

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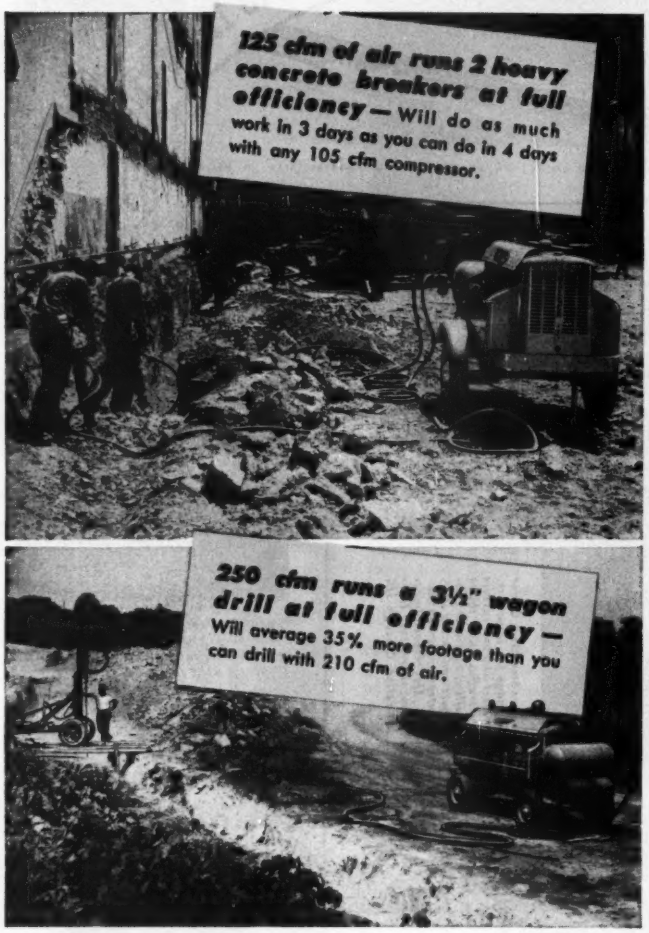
125 cfm of air runs 2 heavy concrete breakers at full efficiency — Will do as much work in 3 days as you can do in 4 days with any 105 cfm compressor.
250 cfm runs a 3½" wagon drill at full efficiency — Will average 35% more footage than you can drill with 210 cfm of air.

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Legal Decisions Concerning Construction

The Idaho Telegram

THE CONTRACTOR had deposited $1,000 with the Sand Bank to the credit of Zyo Jobbing Co. The Sand Bank wired the River Bank to that effect, and the telegram was received after banking hours.

In the meantime the contractor had discovered that the building supplies covered by the $1,000 had not been delivered; and the next morning, before any entries were made on the bank books, and before any rights or liabilities had arisen in reference to the $1,000, another telegram from the Sand Bank was delivered to the River Bank.

"We cancel our previous telegram regarding one thousand credit for Zyo Jobbing Co.," the second telegram stated.

"We demand the money according to the first telegram," the Zyo Jobbing Co. announced, and entered suit, but the Idaho Supreme Court ruled against them in 81 Pac. 111 reported as Brinton *vs* Lewiston N. Bank.

"The Sand Bank had the right to countermand the credit before any rights or liabilities had been incurred or losses sustained in consequence of it, either by the Zyo Jobbing Co. or any third parties," said the Court.

The Verbal Evidence Rule

IF A CONTRACTOR gives a note or other negotiable instrument to a jobber, payable in three months, and the jobber sues, the contractor cannot prove that at the time the note was given there was a verbal agreement that it was to run for four months. This is a simple statement of the familiar legal ruling that a formal written document cannot be varied by verbal evidence.

Suppose, however, that the contractor agrees to sell a building to B, and B demands security that the deed will be delivered.

"I'll give you my note for $1,000, that you can hold until the deed is delivered," the contractor suggests, and B accepts the note. Later on, the contractor delivers a deed of the land, according to agreement, and then B sues him on the note.

(Continued on page 109)

Tested On-the-Job!
Now Ready for You!

NEW BLACK & DECKER 7" QUICK-SAW*

More Powerful!
Improved Balance!
Better Than Ever!

Instant-release trigger switch.

Die-cast aluminum housing for light weight and durability.

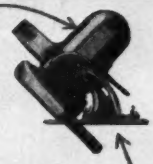
TWO depth adjustments (front and rear) permit handle to be kept at comfortable wrist position even in very shallow cuts.

Cuts almost every building material known with combination, crosscut, ripping and planer blades—new carbide-tipped blades—abrasive discs.

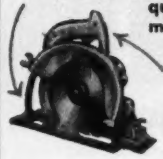
Foolproof telescoping blade guard for maximum safety.

ONLY **$88.50**

Specially-built, heavy-duty B&D universal motor with full-size, grease-sealed ball bearings and hardened armature shaft for abundant power, continuous, trouble-free service.



Easy-to-change depth and bevel adjustments permit cuts from 1/8" to 2 7/16" deep; bevels at any angle from 0° to 45° (calibrated on quadrant). Bevel cuts can be made at any depth adjustment.



Saw-grip handle close to center of gravity for better balance, easier handling.

ONE demonstration—one look at this tool in action—and you'll recognize the quality and performance built into the new Black & Decker 7" QUICK-SAW! It's already been thoroughly tested and proved on hundreds of sawing jobs. Easily cuts *10 times faster* than hand sawing. See it at your nearby B&D Distributor—try it yourself—it's more proof that you can count on Black & Decker to bring you portable electric tool improvements, first! Send for free catalog. THE BLACK & DECKER MFG. CO., 659 Pennsylvania Ave., Towson 4, Maryland.

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PORTABLE ELECTRIC TOOLS

Two-way time savers on foundation jobs!

Easily extendible Monotube steel piles

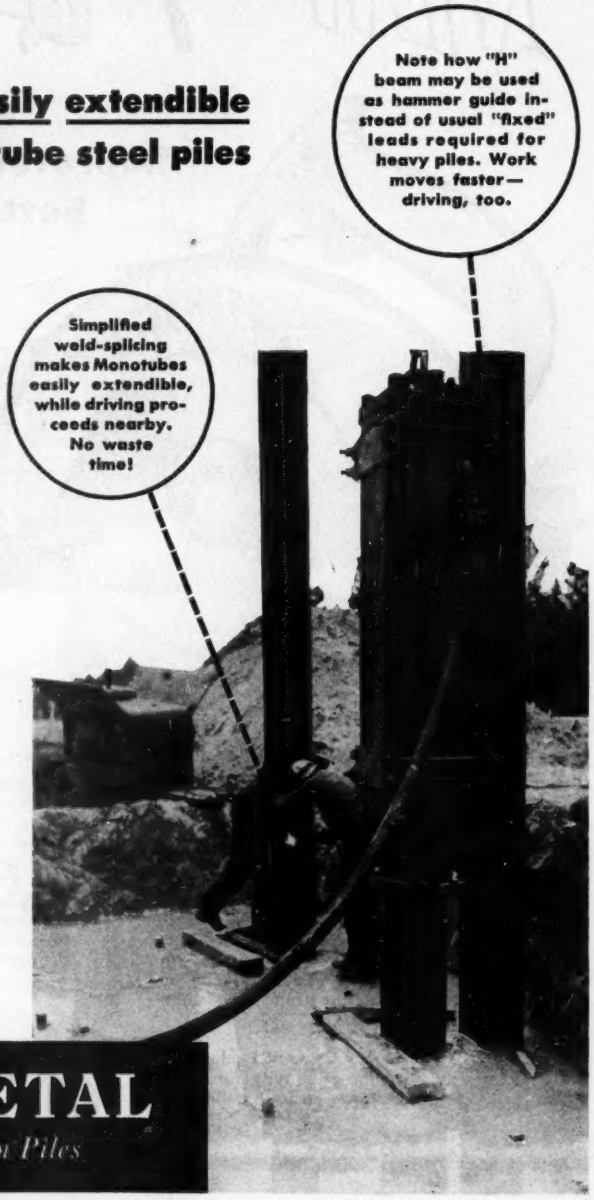
WHEN you find that your foundation piles are driving longer than predicted, the problem is solved quickly with Monotubes. These taper-flute steel piles can be extended easily—right on the job—right to the length you require! Cut-offs can be made easily, with minimum waste. Saving No. 1!

And, extensions can be welded while other bottom sections are being driven. Saving No. 2!

That's just part of the story on how Monotubes help you save time—save critical materials—and save money. Here's more! Monotubes' tapered design and cold-rolled properties provide unusually high bearing values and exceptional lateral stability. High load-bearing values can often be met with fewer piles.

Because Monotubes are lighter in weight, handling and locating go easier and faster. On most jobs a standard, light crane can be used for driving.

Send for complete information. Find out how Monotubes' many advantages bring extra savings in time, in money, on all types of foundations. Write The Union Metal Manufacturing Company, Canton 5, Ohio.


Note how "H" beam may be used as hammer guide instead of usual "fixed" leads required for heavy piles. Work moves faster—driving, too.
Simplified weld-splicing makes Monotubes easily extendible, while driving proceeds nearby. No waste time!

UNION METAL

Monotube Foundation Piles

"The note was given as collateral security that I would deliver the deed. The deed was delivered, and that cancels the note," the contractor contends.

"That's varying a written document by verbal evidence contrary to the rule," B objects, but in cases like this the law is against him.

"Verbal evidence is admissible to show that the delivery of the document was subject to a condition that upon certain events the contract should not be binding," says the Iowa Supreme Court in Oakland Cemetery Assn. *vs* Lakins reported in 126 Ia. 121, in laying down the rule, and there are Colorado, Connecticut, Illinois, Maine, Massachusetts, Minnesota, New York, Tennessee, Virginia and Wisconsin rulings to the same effect.

"80% of the Wholesale Price"

THE CONTRACTOR NEEDED cash and applied to a District of Columbia bank.

"Give us the bond of a good surety company guaranteeing us, and we'll advance you 80% of the wholesale price of the supplies you buy," the bank agreed, and the bond was duly executed and delivered, setting forth that the bank had agreed to advance the contractor not over 80% of the wholesale price of the supplies ordered from time to time, taking as security the note of the contractor secured by a chattel deed of trust on the stock of supplies.

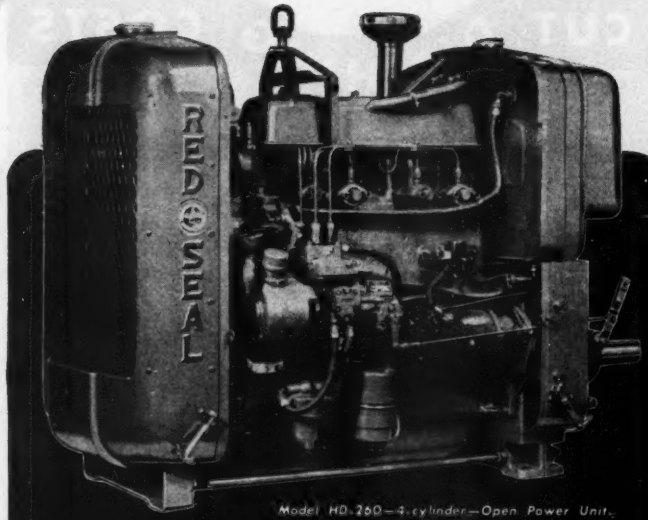
"Now, therefore, the condition of the above obligation is such that, if the said contractor shall, out of the use of such supplies as may be covered by said chattel deed of trust, pay to the said bank the sums so advanced by it on the security of such supplies, with interest thereon at 6%, then the above obligation shall be void; otherwise, it shall remain in full force and virtue," the bond stipulated.

"So far so good, but what about the other 20%?" the contractor asked himself, and applied to the bank to advance more money.

"We'll have to charge you 8% in that case," the bank stipulated, advanced more than 80% of the wholesale price of the supplies, charged 8% interest on such advances, the contractor failed to pay, and the bank sued the surety

(Continued on next page)

CUT DITCHING COSTS
with a BRISCOE DITCHER
IT DIGS
IT CLEANS
IT SLOPES
Faster, more complete cleaning jobs plus faster, deeper new ditches with the Briscoe Ditcher.
Cuts costs of digging a ditch to as low as $24 a ¼ mile! Largest model moves over 500 cubic yards of earth an hour.
CUTS COST TO 2¢ A CUBIC YARD
8 separate hydraulic controls give operator push-button action on steering, depth, leveling, tail support, wing angle, and spoil wings. Operates smoothly in water, thick brush, or heavy soil.
Complete demonstration for any Conservation District without obligation.
Write Mel Briscoe General Manager Dept. D-3
E. V. Briscoe & Son: In muck and weeds, wire grass and bog muck, flags and tules ... the Briscoe Ditcher took it all . . . with colors flying. We're thoroughly satisfied.
Clear Lake Water Co.
E. V. Briscoe & Son: We own and use 6 Briscoes for cleaning laterals ... which have cut costs for us.
Fresno Irrigation District
E. V. Briscoe & Son: A cost reduction from $240 a mile to $10 a mile.
Coast Co.
E. V. BRISCOE & SON KERMAN CALIFORNIA



Model HD-260—4-cylinder—Open Power Unit.
25 to 50 shaft horsepower for intermittent duty.
20 to 40 shaft horsepower for continuous duty.

RED SEAL CUSHIONED POWER
DIESELS
COST LESS TO RUN
AND TO MAINTAIN

Continental Cushioned Power Combustion Chamber with Dyna-Cell not only gets ALL the power from the fuel, but smooths and prolongs the power impulse, preventing the development of destructive peak pressures usual in engines of Diesel type. This avoidance of extreme pressures lengthens engine life. It speeds and simplifies service, by permitting wide interchangeability of parts between Red Seal Diesel and gasoline models. Moreover, the weight-to-horsepower ratio is unusually favorable, a consideration of great importance in many applications. Choose Continental Cushioned Power Diesels for lower costs . . . longer useful life.

CONTINENTAL MOTORS · Powerful as the Nation · AMERICA'S STANDARD

YOU CAN PLACE FULL CONFIDENCE IN THE PRODUCT OF THE MANUFACTURER WHO HAS CHOSEN CONTINENTAL RED SEAL AS THE HEART OF HIS MACHINE

Continental Motors Corporation
MUSKEGON, MICHIGAN

LEGAL DECISIONS . . . Continued

company in the District of Columbia Courts.

"You advanced more than the stipulated 80% limit," the surety company pointed out.

"All we're asking you to make good is the 80%, and we'll look to the contractor for the balance."

"No, when you went beyond the limit, you broke the bond and relieved us from the liability," the surety company contended, and the District of Columbia Court of Appeals in Commercial N. Bank vs London & L. Indemity Co. reported in 10 Federal Reporter, 641, ruled in favor of the surety company.

"It is a well-established rule that a contract of surety-ship should be strictly construed, so as to impose upon the surety only such burdens as clearly respond to the terms thereof, and should not be extended by implication or presumption to cover other burdens not coming within its scope. Therefore, in order to recover in this case, the bank was bound to plead, and, if required, should prove, all facts necessary to show a strict compliance with the terms of the bond," said the court in laying down the general rule.

"No Arrival"

THE CONTRACTOR had bought lumber to be shipped "per steamer *Tela*."

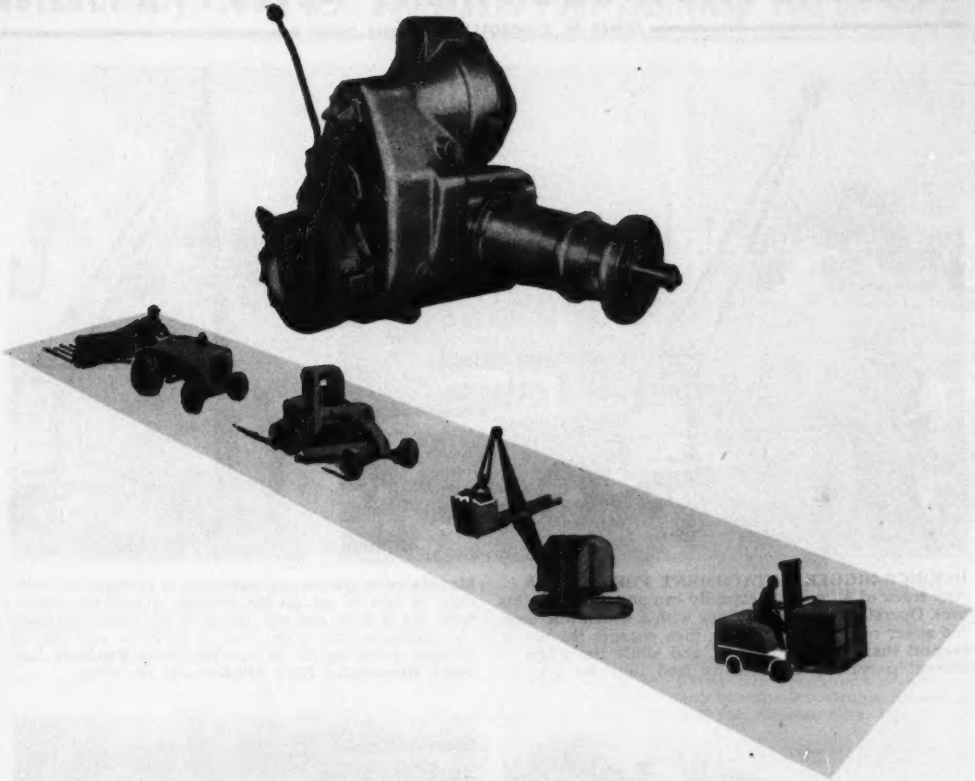
" 'No arrival, no sale,' " the contractor stipulated. "Yes, that's thoroughly understood," the seller agreed, and loaded the lumber on the proper steamer.

During transit, however, it became necessary to shift part of the lumber to another steamer so that part of the lumber arrived on the steamer *Tela* and the balance on a steamer of a different name and tonnage, but both steamers arrived so as to deliver the lumber within the time limit specified.

"The lumber did not arrive on the steamer *Tela*, and 'no arrival, no sale,' " the contractor contended, in refusing to accept delivery.

"All I had to do was to ship by the steamer *Tela*, and as long as the lumber arrived in time it is immaterial what steamer landed it," the seller contended, and the United States Supreme Court ruled in his favor in Harrison *vs* Fortlage reported in 161 U. S. Reports, 57.

"The contract no where requires that the lumber should arrive by the particular steamer named," said the Court.



CLARK

designs and builds special power-transmission equipment for many companies—for tractors—road machinery and other mobile equipment to be used on farms and in industry.

THERE'S NO SOUNDER GUARANTEE OF A BETTER PRODUCT THAN TO WORK WITH CLARK

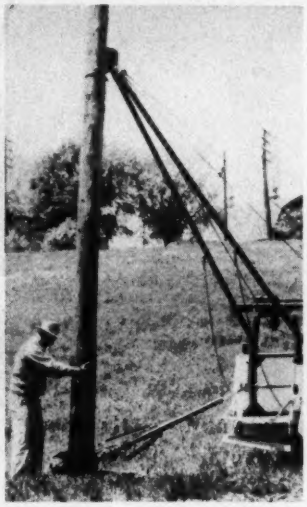
PRODUCTS OF CLARK—TRANSMISSIONS • AXLES • AXLE HOUSINGS • TRACTOR DRIVE UNITS • FORK TRUCKS AND TRACTORS POWERED HAND TRUCKS • GEARS AND FORGINGS • ELECTRIC STEEL CASTINGS • RAILWAY CAR TRUCKS

CLARK EQUIPMENT COMPANY • BUCHANAN, MICHIGAN

Other Plants: **BATTLE CREEK** *and* **JACKSON, MICHIGAN**

CONSTRUCTION EQUIPMENT NEWS . . . A Preview of

JAMES M. CONNOLLY, Equipment Editor



DERRICK-DIGGER ATTACHMENT FOR TRUCKS
Any truck of ¾- or 1-ton capacity can accommodate this unit. Operator lowers the digger with a winch line until the auger rests on the ground; then engages the power take-off shaft to start digging, and while the auger is boring, smoothing controls its feed into the ground. Manufacturer claims two-man crew in normal soil needs only 10 min to set up the derrick, attach the digger, bore out a hole and set the pole for tamping. Interchangeable augers range from 8 to 20 in. and the rig handles poles up to 35 ft.—**Tel-E-Lect Products Inc., 10063 Minnetonka Blvd, Minneapolis 16, Minn.**

STRAIGHT BLADE BULLDOZER FOR CAT DW10
Similar in design to other Caterpillar bulldozers, components of the 10S include blade, push arms and braces, hitch, sheave support, radiator guard and a combination cable and sheave group. Trunnions on the new model are supported in the weight box and frame group, however, which includes accommodation for four counterweights. These four total 7,000 lb and are required to provide enough traction on the DW10's driving wheels. Counterweight box has been designed with a towing hitch so that the tractor can also be used for drawbar purposes.—**Caterpillar Tractor Co., Peoria 8, Ill.**

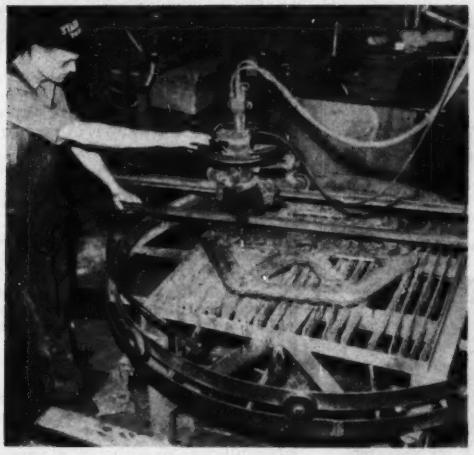
HEAVY-DUTY CHAIN SAWS AVAILABLE AGAIN
Because of heavy demands on their output by all branches of the armed forces, Disston's extra-duty chain saw—the DH 120—has been unavailable to civilian consumers. Their one-way route through the olive-drab paint-spraying room has been detoured now, and they're once more available through the company's chain of dealers. The manufacturer can now meet both military commitments and civilian demands. Shown above on a tough trestle job, the 12-hp unit literally chews through timbers up to 12x12 in. in size.—**Henry Disston & Sons Inc., Unruh and Milnor Sts., Philadelphia 4, Pa.**

New Machinery, Tools and Equipment That Will Help You on the Job

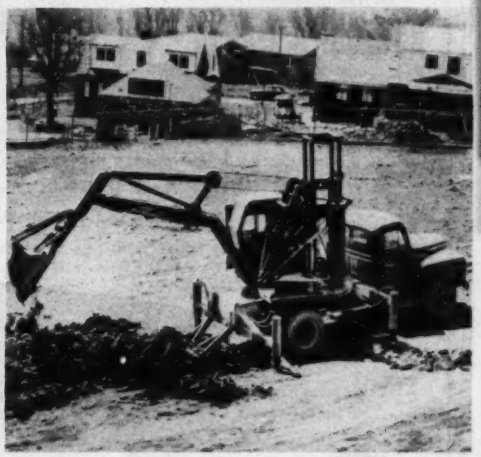
WET-CUTTING CONCRETE SAW HANDLES SLABS UP TO 6½ IN. DEEP Pictured here is the Clipper Model C 130, a gasoline-powered concrete cutting saw which is making light work of slicing through 3½ in. of asphalt material for Gas Service Co., Kansas City, Mo. Screw feed controls vertical movement, and adjustable depth lock can be pre-set to prevent wasteful overcutting. Front section of blade guard is hinged for cutting piping or curbing. The 12-in. dia blade can cut to 4 in.; the 18-incher as deep as 6½ in.—**Clipper Manufacturing Co., 2800 Warwick, Kansas City, Mo.**

VERSATILE LOADERS—By adding a crane hook, dozer blade, fork or snow plow, this becomes a year-round rig. Rapid tilt-back on bucket permits carrying of heap loads. With bucket extended, outside turning radius is only 16 ft.—**Contractors' Machinery Co., Inc., Batavia, N. Y.**

CORRUGATED ROOF DECKING—A full 14-ft 4-in. piece is easily handled by one man. Sheets cover up to 35 sq ft and their ribs are same size as trimmed 4s 2x4's. Sheets are mass-produced on a rotary corrugator.—**Granco Steel Products Co., Granite City, Ill.**



CIRCULAR JIG FOR OXYACETYLENE CUTTING Even the most intricate cuts are simplified with this cutting jig—and without moving the part being cut. An angle-iron table forms the jig base, to which a 5-ft dia steel band is bolted. A set of rollers rides this band and supports another ring, which in turn holds the cutter and its tracks. One end of the cutter track is pinned; the other slides on a bar railing. Thus, by rotating the upper band, sliding the cutter on its track or sliding the track on its pipe support, intricate patterns are easily cut.—**C. E. Cummings Co., LaDue, Mo.**



NEW TRUCK-MOUNTED HYDRAULIC DRAGSHOVEL The Hydrohoe, a completely hydraulic dragshovel, made its debut recently to answer the need for a machine for quick trenching and specialized digging. A hydraulic ram supplies the force for primary digging action and in addition the boom telescopes; the combined action leaving a scallop-free cut. Another feature is a hydraulic ejector built into the 18-in. bucket. Every work function is hydraulic, controllable to a fraction of an in. Maximum reach is 23 ft; effective depth over rear of truck, 12 ft 6 in.—**Bucyrus Erie Co., South Milwaukee, Wis.**

STURDILITE

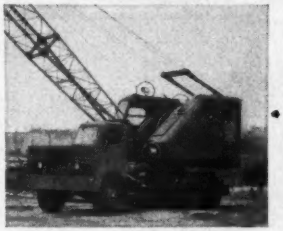
The HEAVY-DUTY FLOOD LAMP THAT

Lights Your Work Better . . . Gives Longer Service at Lower Cost

Vibration-absorbing Base

Specially Designed for Efficient Service on

Shovels — Excavators — Drag-lines
Roadbuilding Equipment
Locomotive Cranes — Tractors



"BUILT to take it," say users of STURDILITE Heavy-Duty Flood Lamps, after years of trouble-free service. Hermetically sealed-beam lamp—no reflector to become tarnished. Complete assembly mounted on rubber cushioned base that absorbs vibration and shocks. Available in 6-8, 12-16, 24-28 and 110-120 voltages.

COMPLETE BULLETIN, specifications, and quantity prices sent promptly upon request.

Metal Spinning Division

PHOENIX PRODUCTS COMPANY

4729 N. 27TH STREET, MILWAUKEE 16, WISCONSIN

Non-Leak • Easy Pouring

Press formed trays, doubled folded corners with three thicknesses make JACKMANCO barrows leak proof. Capacity 5 cu. ft. Your local dealer has them in all steel, steel and wood, pneumatic tires, with plain or roller bearings or steel wheels.

JACKMANCO
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Superior Products Since 1876

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JACKSON MANUFACTURING CO.

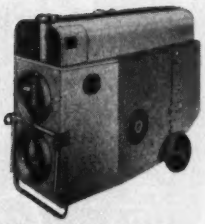
HARRISBURG • PENNSYLVANIA

ALUMINUM WELDING RODS—Heretofore, on architectural structures in particular and for many other applications in general, anodized silicon-bearing welding rods have shown an objectionable dark weld on aluminum work. New EutecRod 22FC for oxy-acetylene and oxy-hydrogen application provides matching base metal, manufacturer claims. Low-melting flux coating flows with minimum heat application, precluding stoppages often occurring when separate flux rod is used. Special flux, right on the alloy prevents metal from running away and allows in-position welding. Available in 1/8 and 3/16 in. dia.—**Dept. Tis, Eutectic Welding Alloys Corp., 172nd St. & Northern Blvd., Flushing, N. Y.**

PIPELINE ROCK SHIELD FOR ROUGH LOCATION—Said to protect pipe in rocky areas, at river crossings, in swamps, at road or railway crossings and wherever pipe encounters rough usage, the maker of Rock Shield recommends this cushioning material of high impact strength. Applied by two men and secured with pressure-sensitive Scotch tape or metal strapping, it won't sag or stretch, nor will it crack or strip under the torsion and attrition of soil stresses.—**Owens-Corning Fiberglas Corp., Toledo 1, Ohio.**

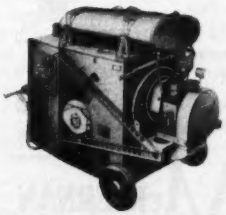
ELECTRIC IMPACT TOOL—A heavy-duty electric motor built into Size 34U Impactool delivers 900 rotary impacts per min for nut tightening or removal jobs, but is not itself subject to the shock of impacting. Grip handle can be adjusted to any of three locations or entirely removed. Motor and impact unit are placed side by side to allow underside bolt tightening without need for jacking trucks, etc. Rated for bolts up to 1¼ in., 1-in. sq driver will fit over 100 different available power sockets and accessories.—**Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.**

I find I can't afford cheap portable heaters



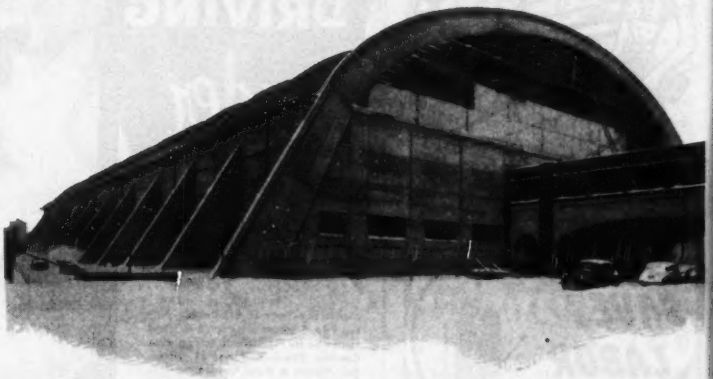
HERMAN NELSON DE LUXE I
Capacity 280,000-450,000 BTU/hr.
Completely automatic, including temperature control.
Fresh air delivery 2,000-2,350 cfm.
Electric motor powered.

HERMAN NELSON ECONOMY MODEL
Priced lower for smaller jobs.
Capacity 125,000-190,000 BTU/hr.
For 115/230 volt A.C.
Costs but 19¢ per hour to operate.



HERMAN NELSON STANDARD MODEL
Capacity 250,000-385,000 BTU/hr.
Gasoline engine powered.
Completely self-contained.
For areas lacking electricity.

THEY'RE *unsafe*... AND TOO COSTLY!



THIS isn't double talk. Top construction men tell us the *safety* factor of Herman Nelson portable heaters pays real dividends. Their exclusive "sealed flame" feature eliminates fire and fume hazards and supplies heat that's "fresh air" clean.

Play safe on this winter's construction jobs. Quick, clean, *safe* heat from Herman Nelson portable heaters will cure those job lags and make man hours more productive.

Make a deal now with your nearest Herman Nelson dealer—while he can supply you without a long wait. For his name just write to Dept. CM-9 at the address below.

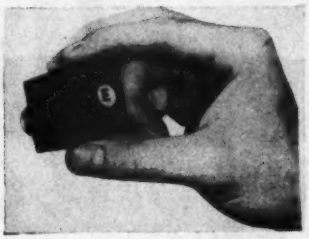
Today's Best Buy is Better Air!

AAF herman nelson

HERMAN NELSON

Division of **AMERICAN AIR FILTER COMPANY, INC.**

MOLINE, ILLINOIS



COMPACT 3-POSITION INDICATOR—is remote reading, and consists fundamentally of a rotating card which exhibits one of three printed symbols at a small round window in one end of its box. The card is rotated by two solenoids which draw it up or down to either of two extreme positions. When neither of these coils is energized the third symbol appears, held in place by spring balance in its neutral position. Solenoids can be actuated by a variety of commonly used float, pressure or contact switches in a simple wiring circuit. Based on an Aircraft Landing Gear Position Indicator, it can be used to maintain checks on level of lubricating oil, coolants, chemicals or any reservoir contents, large or small. It can also assure

SANSTORM
SAVES LABOR
Cut labor costs. Sanstorm Sandblasters are fast -- more thorough. Need no skilled operators. Cut your labor requirements to the bone.
Only Sanstorm Sandblast Machines offer exclusive Non-Stop, Non-Plug Action—with either hard or soft abrasives.
FOR PROOF! FREE FOLDERS
Write Charles K. Spears
SANSTORM
modern SANDBLAST MACHINES
Santa Clara & H Sts. Fresno, California
DEALERS IN ALL PRINCIPAL CITIES

McKiernan-Terry 11-B-3 Double-Acting Pile Hammer driving 85-ft. steel H-beams for the 4000-ft. bridge over Corrites Channel. Terminal Island, Cal. Procter & Kuhn, sub-contractors to United Concrete Pipe Corp.

1170 STEEL PILES had to be driven under water during the construction of this longest, highest vertical-lift bridge on the Pacific Coast. 390 steel piles, 85 feet long, were hammered full length, without follower, into unstable soil to required elevation. At cut-off the anvil block or base of the hammer was 12 feet below the surface of the water. In addition, 780 shorter piles were driven for the lift-span piers. • McKiernan-Terry Double-Acting Pile Hammers were chosen for the job because (1) they were the first pile hammers developed for underwater driving and (2) they have held an unsurpassed reputation for underwater driving dependability through the years. • 17 sizes of hammers and extractors are available in the complete McKiernan-Terry line. Write for bulletin giving all the facts.

GRAB BUCKETS

COAL TOWERS

TRANSFER BRIDGES

McKIERNAN TERRY

McKIERNAN-TERRY CORPORATION, MANUFACTURING ENGINEERS
14 PARK ROW, NEW YORK 38, N. Y.
Plants: Harrison, N. J., Dover, N. J.

MK 881

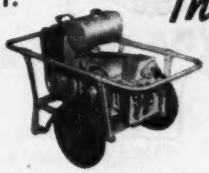
equipment operators of mechanical relationships, settings and positions not accessible for inspection. The sealed brass case is impervious to dust and dirt, and the unit can withstand high-low temperature tests from minus 85 deg to 158 deg, says its manufacturer. It will also pass vibration tests of .018 in. to .020 in. amplitude between 300 and 3000 cycles per min, as well as 4-hr cyclic thermal shock tests. Symbols on the card can be designed to meet job requirements.—**The Riverside Metal Co., (George Peterson, Mgr.) Special Products Div., Riverside, N. J.**

REMOTE FOOT CONTROL for voltage on arc welders.—Many standard dc welding units have a socket which will take the plug on this foot-operated variable resistor. Most others, including ac's can be quickly adapted for it. It gives instant selection or variation of any welding heat within the capacity of a machine, says the manufacturer. It also improves the soundness of welds by providing a hot start which helps to overcome porosity and cracks on cold work. After 2 or 3 in. have been welded, voltage can be stepped down easily, balancing heat input with dissipation. Voltage on the ARCTROL can be varied to the extreme of actually extinguishing the arc at completion of a weld, thus avoiding any cratering. Information on application of this control to specific welding machines is available from—**Mullenbach Electrical Manufacturing Co., 2300 E. 27th St., Los Angeles 58, Calif.**

GENERAL PURPOSE PUMPS — designated as type SCC, they are claimed to be extremely adaptable and well suited for any small pump application as well as booster or process pumping. Of the close-coupled type, their standard mountings are vertical, but by adding motor ft they can readily be adapted for horizontal mounting. Two sizes are currently available: 2-in. suction and 1¼-in. discharge, and 1½ in. by ¾ in. Both operate at 3450 rpm and capacities range to 100 gpm at heads up to 120 ft. Catalog D851 contains full information.—**Economy Pumps Inc., Div. of Hamilton-Thomas Corp., Hamilton, Ohio.**

for
MUNICIPAL PAVING
HIGHWAY WIDENING
and PATCHING
BRIDGE DECKS
SPILLWAYS
and
MANY OTHER JOBS

1.



THE JACKSON

ELECTRIC, VIBRATORY SCREED is FAR FASTER-BETTER!

It strikes off to any crown, undercuts at curb or sideform, works right up to and around manholes and other obstructions. With it center construction joints may be eliminated and full widths (up to 30') poured. Requires only two men on widest slab, due to strong tendency to propel itself. It's the only screed that can be rolled back on 4 rollers for second pass. Contractor has only to secure plank cut to proper length and crown to be set for any job. Powered by Jackson 1.25 KVA Portable Power Plant.

2.

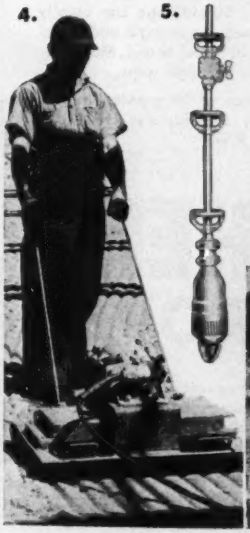
3.

IDEAL VIBRATORS FOR EVERY TYPE OF JOB

1. Power Plant used with Screed, 1.25 KVA. Others of 2.5 and 5 KVA capacity — all produce both single and 3-phase 110 V., 60 C. AC and have generators requiring no maintenance or adjustment. 2. Powerful, easy to handle electric Vibrator — shafts up to 28'. 3. Finest of engine-driven flexible-shaft vibrators. 4. Revolutionary, fast, granular soil vibratory compactor. 5. Heavy-duty mass construction vibrator — a "must" on dams, etc. 6. Sideform Vibrator, mounts on finisher, saves better part of 2 men's labor. Write for "Pocket Guide" describing the entire line.

FOR RENT OR SALE AT JACKSON DISTRIBUTORS

4.



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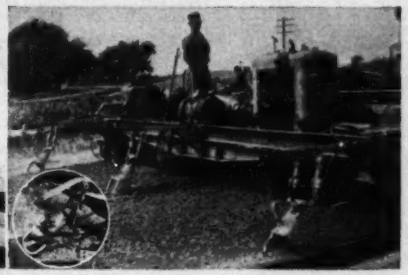
ELECTRIC TAMPER & EQUIPMENT CO.
LUDINGTON MICHIGAN



SPECIFY
STRONGER—SAFER
"HERCULES"
FLATTENED STRAND

- 10% extra strength
- Larger metallic area
- Smooth running
- Smooth wearing
- Easier to rig
- Extra safety
- Extra economy
- RED STRAND quality

SPREADS THE LOAD
FOUR WAYS

"Hercules" Flattened Strand design spreads wear over *four* wires—not just one as in round strand. This compact outer surface greatly reduces wear in grooves of drums, sheaves and idlers. Tends to keep them smooth.

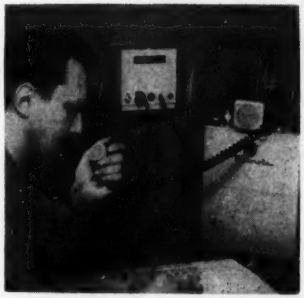
The triangular cross-section of the strands permits a smaller core, larger contact area between strands, and greater resistance to crushing. A smaller size Flattened Strand rope can usually be used for the same strength and safety requirements as round strand. Makes for easier rigging in tough spots.

Take advantage of the greater strength and economy of "Hercules" Flattened Strand Wire Rope.

LESCHEN
WIRE ROPE

Consult our Engineering Department for specific recommendations. A. LESCHEN & SONS ROPE CO., 5909 Kennerly Ave., St. Louis 12, Missouri. Distributors in all principal cities.

LAMINATED BOMB WINDOW—After considerable testing, a special window has been developed to minimize effects of explosions. The glass-plastic laminate known as Flexseal Bomb Glass, will resist normal atmospheric pressures, but when these are exceeded by a blast or sudden pressure wave, the window opens automatically by folding about its edges, minimizing possibility of flying glass. Outer layer of laminate is glass, middle sheet is partially segmented polyvinal plastic, and inner layer consists of four triangularly-shaped pieces of glass. The plastic layer extends beyond glass edges and is fastened to the window to act as a hinge and permit the four segments to swing in like doors when the outer glass is broken. The plastic will stretch to 400% of its unstressed length, the manufacturer states, and return to within half of 1% without rupture. After opening and return, the segments may be fastened together with tape, putty, etc; affording transparent protection until entire window can be replaced. **—Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh, Pa.**



2-WAY RADIO RUNS ON BATTERY OR 110 V—Known as the Pack Set Power Supply, this handy gadget makes it equally easy to operate the Motorola FM 2-way radiophone pack unit by making it convertible to semi-fixed or mobile application, preserving the batteries for portable use only. The plug-in power connection and switching facilities permit quick changeover to 110-117 as shown above or to a 6-v DC primary power supply such as that found in a pickup truck or car. Fastening bracket is easily detached.**—Motorola Technical Information Center, Communications and Electronics Div., 4545 W. Augusta Boulevard, Chicago 51, Ill.**

RUNNING-TIME RECORDERS — Furnished in wall, portable or flush-panel models, machines record "on" time of production machinery and equipment in magnified reading, "off" time in more compact form. Chart is readable in hr, min and sec. **—The Bristol Company, Waterbury 20, Conn.**

LASTS TWICE AS LONG ...STILL GOING STRONG

QUAKER CONVEYOR BELTING

LASTED LONGER THAN ANY OF SIX OTHERS

A "belt-killing" drive on a well-known trench digging machine was wearing out conveyor belts in a matter of weeks or months. Then a Quaker "Pre-Tested" Conveyor Belt was installed. Result . . . belt lasted almost twice as long as any of the six different belts used . . . still going strong . . . in fine shape.

Performance records like this and thousands of others are making more and more operators specify Quaker Industrial Rubber Products on all of their equipment.

Whether your needs are conveyor belting for hauling rocks, sand, gravel or aggregates . . . or flat transmission belts, V-belts . . . Quaker has a performance-proved belt that will do the job. See your Quaker distributor, or write us today for the new Quaker catalog on all industrial rubber products.

QUAKER RUBBER CORPORATION

DIVISION OF H. K. PORTER COMPANY, INC.

PHILADELPHIA 24, PENNA. BRANCHES IN PRINCIPAL CITIES

WORLD'S FOREMOST "SHAKE-DOWN ARTIST" GETS

Greater Soil Compaction

IN TWO PASSES—THAN 25 TON ROLLER ATTAINS IN EIGHT!

The Vibro-Plus Vibratory Soil Compactor type MRJ-6. It weighs only 1.6 tons. Vibrating 950 times per minute, it effectively compacts up to 2,000 sq. ft. per hour under its own power, penetrating as deeply as 40 inches. Towed by tractor, it accomplishes about four times more work.

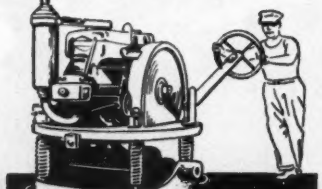
Useful where larger equipment can't go—on open areas, too, it convincingly outperforms other equipment—**achieving up to 97.2% of absolute compaction in only 2 passes, compared to 94.2% in 8 passes with a 25-ton rubber-tired roller; 95.6% in 6 passes with an ordinary 12-ton roller; 96.2% in 6 passes with a 7-ton vibratory roller.**

You easily can figure how this favorably-priced **Vibro-Plus** equipment will save impressive amounts of time and money on your jobs. Write for complete facts and name of nearest distributor.

Driven by a 10 H. P. diesel engine, the MRJ-6 is recommended for compacting roads, railway embankments, backfills earth dams, airfields, soil under floors and foundations, etc.

One man can "walk" this **Vibro-Plus** Compactor or it can be towed by tractor. The 65" x 45-5/16" base is steered by turning the steering wheel. Rubber-tired wheels attach easily for transportation.

VIBRO-PLUS Soil Compactor—one of the complete line made by the pioneers in vibrating and compacting



VIBRO·PLUS PRODUCTS, INC.

54-11 QUEENS BOULEVARD
WOODSIDE, L. I., NEW YORK

LIFTER WORKS BY SUCTION—Usable on all non-porous, rigid materials—metal, glass, fiber, plastic, linoleum, tile etc, and on flat or curved surfaces, this Ipco safety parts lifter handles cups with 1½-, 2½- or 4-in. dia. By slapping the lifter on an object to be picked up, a vacuum is produced which can be released only by depressing a thumb lever. Excellent for feeding small parts to a saw, grinder, machine or the like.—**Industrial Products Co., 2989 N. Fourth St., Philadelphia 33, Pa.**

TRUCK CRANE BOOM—Available in 25-ft length with 5-ft extensions, new Bantam boom is said to have four times more rigidity than standard models, when used on company's 5-ton truck-mounted shovel-crane. This is due to heavier bracing and reinforcing to resist shock and sling-load conditions.—**Shield Bantam Co., Waverly, Iowa.**

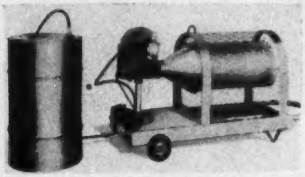
Clean up your shop and your job...

put unused scrap to work for AMERICA!

Don't let metal scrap lie idle. It's vital to keep America's production at peak level. Steel producers need 37,000,000 tons of scrap a year to serve you and America. Remember: today's scrap is tomorrow's production of steel for the American Way. It can also make the tanks, guns, and shells to protect our future security. In the shop... or out in the field... clean up after *every* job—and *"Get in the Scrap!"*

LACLEDE STEEL COMPANY
St. Louis, Mo.

PORTABLE DEHUMIDIFIER—Model DMS-4 will dehumidify a closed area of tight construction up to about 8,000 cu ft. It connects to a 115-v 60-cycle circuit, and draws 2 amp. Moisture-collection pan can be emptied manually, or connected to hose or pipe for automatic discharge. Dimensions are: 17x13x15½ in. Weight is 55 lb.—**Abbeon Supply Co., 58-10 41st Drive, Woodside, N. Y.**

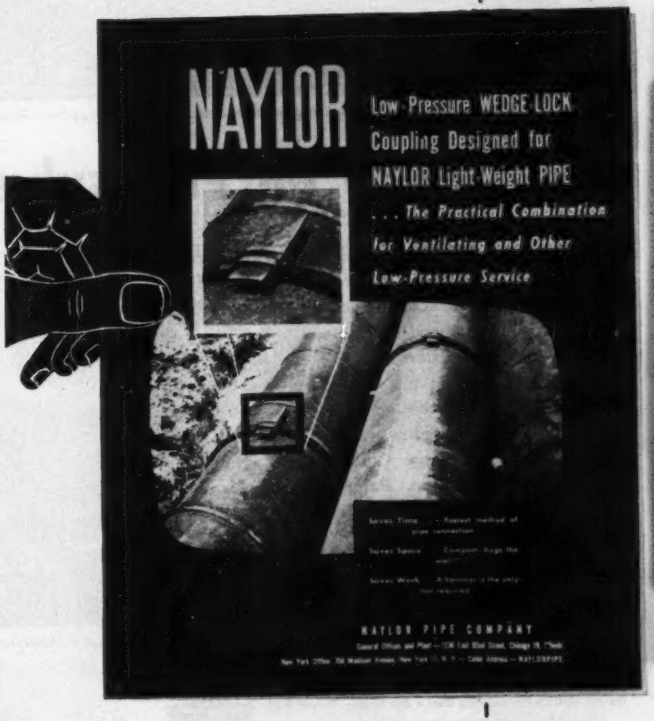


PORTABLE OIL HEATER PRODUCES 189,000 BTU/HR—Demanding only regular 110-v, 60-cycle current and No. 2 fuel oil, this ECO-TEMP portable oil-fired radiant heater is usable in a number of different ways on a construction job. With a rapid rise to maximum temperature and wide effective heat area, the manufacturer recommends it for drying plaster, paint, concrete; thawing coal, sand, machinery parts; warming up equipment for easier starting during cold weather; space-heating new construction, shanties, repair shops. Fuel is drawn through any length of hose from a drum at a rate of 1.35 gph. Measuring 48 in. long, 18 in. wide and 31 in. high, the entire rig weighs 175 lb and can be pushed like a wheelbarrow. Two men can readily carry it from floor to floor.—**Arthur C. Baumann, Dept T, 7011-21 Grays Ave., Philadelphia 42, Pa.**

RUST PREVENTIVE — Powerfilm rust and corrosion preventive is said to get under and displace any moisture present. When brushed, sprayed, or wiped on metal surfaces, it dries to a tough non-oily protective film that will not crack or chip. Powerfilm thins when stirred or brushed, and thickens on standing—therefore applies without running or sagging. It is particularly recommended for protecting equipment, such as unpainted chains, sprockets, or gears, that stands out in all weathers. It can also be used to prevent snow and ice from sticking to snow-removal equipment.—**The Thomas Co., Chemical Coatings Div., 1645 Hennepin Ave., Minneapolis 3, Minn.**

FORM CLAMPS—Principal feature of Hex-Lock Clamp is combination of floating nut and bracket as a unit. Maker claims a decided advantage in form tightening with metal-to-metal turning, compared with round washer-like castings which ordinarily are rotated directly against form face or walers.—**Williams Form Engineering Corp., 1501 Madison Ave. S. E., Grand Rapids 7, Mich.**

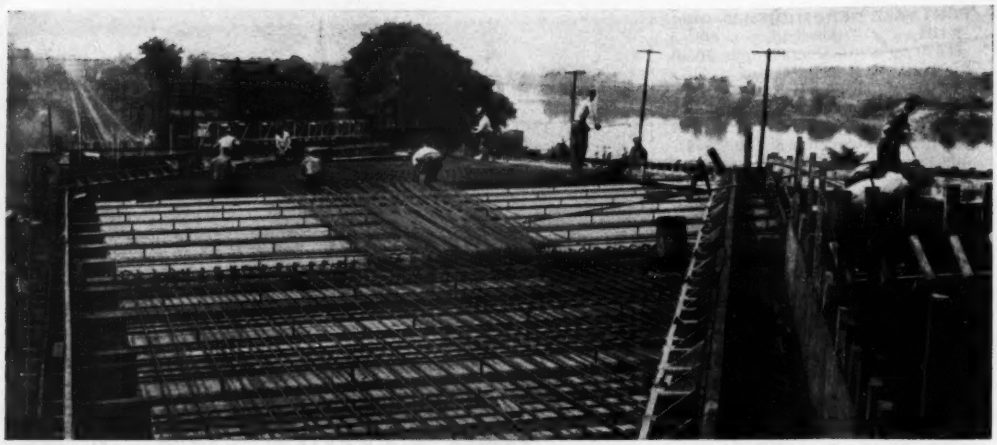
HERE'S THE EASIEST WAY TO CONNECT NAYLOR PIPE IN LOW-PRESSURE SERVICE


NAYLOR
Low-Pressure WEDGE-LOCK Coupling Designed for NAYLOR Light-Weight PIPE
. . . The Practical Combination for Ventilating and Other Low-Pressure Service
NAYLOR PIPE COMPANY

Send for this new Bulletin No. 514 on the Naylor Low-Pressure Wedge-Lock Coupling. See how quickly and easily ventilating and other low-pressure or temporary lines can be made up with this practical coupling medium and no other tool but a hammer. Coupling sizes for light-weight pipe from 8" to 30" in diameter. Write today for your copy.

NAYLOR PIPE

Naylor Pipe Company, 1268 E. 92nd St., Chicago 19, Ill.
New York Office, 350 Madison Avenue, New York 17, N.Y.



Network of Bethlehem Reinforcing Bars in deck of highway bridge over Lehigh Valley Railroad near Pittston, Pa.

New Bridge on Pennsylvania's Route 5

One of many relocation projects recently carried out for the Pennsylvania Department of Highways was a short stretch of Pennsylvania's Route 5, between Port Blanchard and Pittston, Pa. The job involved the construction of a two-lane bridge, plus approaches, to carry traffic over tracks of the Lehigh Valley Railroad. The new structure, shown in the accompanying photographs, was built adjacent to a narrow, outmoded bridge. Contractor: Wagner Construction Co., Kingston, Pa. Bethlehem furnished bridge reinforcing, bar mats, and dowel units.

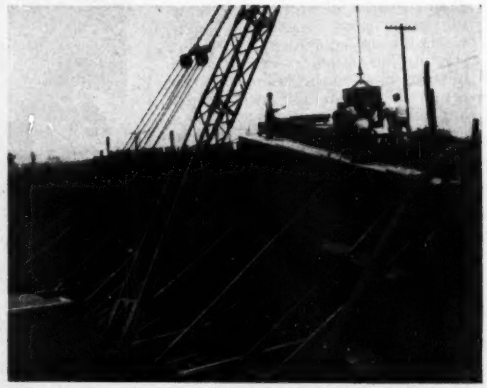
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

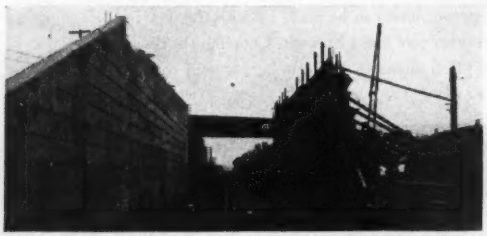
STEEL FOR HIGHWAYS

Dowel Units • Reinforcing Bars • Bar Mats • Guard Rail
Guard Rail Posts • Wire Rope and Strand • Pipe
Hollow Drill Steel • Spikes • Bolts and Nuts
Timber Bridge Hardware • Tie-Rods
Sheet- and H-Piling • Fabricated Structural Steel

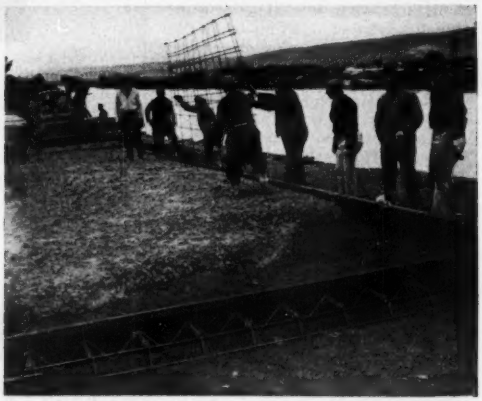
BETHLEHEM STEEL



Rigged with heavy wire rope, crane lowers bucket of concrete over bridge form.



General view of construction, as seen from caboose. Form at right is readied for pour. Narrow, outmoded bridge is visible at far side of form.



Workmen place Bethlehem Hinged Bar Mat over first course. Bethlehem Dowel Unit, designed to minimize load-transfer problems, is shown in foreground.

Save Top Carrier ROLLS

with

STOODY 1027

Don't throw top carrier rolls away! They're too hard to get these days. When the tractor is down for repairs to track, sprockets, idlers or rollers—rebuild top rolls with Stoody 1027.

Stoody 1027 gives longer service, resists the wearing of flat spots when rolls freeze up with mud. Rolls should be rebuilt before too serious wear occurs.

See your Stoody dealer . . . or write for folder on welding procedure for top carrier rolls.

STOODY COMPANY

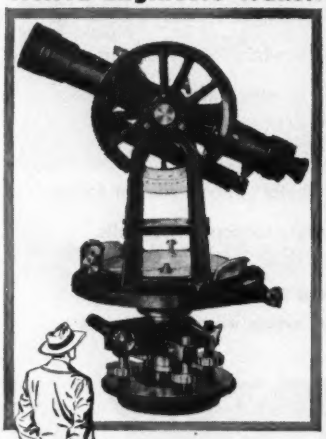
11972 EAST SLAUSON AVENUE, WHITTIER, CALIFORNIA

Have you seen the important

NEW FEATURES

on the

WHITE Engineers' transit



YES, the White Engineers' Transit is a fine engineer's instrument — now made even finer with the addition of *covered leveling screws* and *coated optics*.

Covered leveling screws assure you of smooth, easy, precise leveling at all times, under all kinds of conditions for the life of the instrument itself.

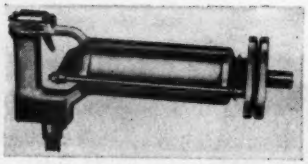
Coated optics guarantee clear, sharp, accurate images — without halation, at longer distances, even under adverse conditions.

Compare the David White Engineers' Transit with all others — feature for feature — price for price. Compare them for accuracy — long durability — built-in quality. To meet your preference, this instrument is available with "U" or "A" type standards. You'll find you'll buy right when you buy a David White.

Contact our nearest dealer for complete details of the David White Engineers' Transit and for other fine Engineering Instruments — or write direct to David White, 343 W. Court Street, Milwaukee, Wisconsin.

DAVID WHITE

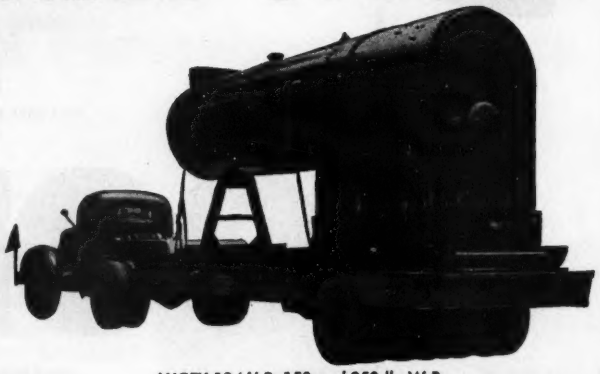
We offer complete, prompt repair service on all makes of instruments — levels, transits, theodolites, etc.



ELECTRO-MAGNETIC DRILL—The whole secret behind this new electro-magnetic hammer drill is the automatic rotation of its carbide-tipped, spiral-fluted drill which the maker claims will speed up hole drilling, eliminate manual turning of the drill chuck and reduce fatigue. This automatic rotation is accomplished by a rubber ratchet mechanism which is in turn actuated by the recoil of each blow of the piston —3,600 blows per min! Latest in a long line of electric hammers and hammer drills, it is recommended for high speed hole drilling in concrete, brick and stone.—**Syntron Co., 500 Lexington Ave., Homer City, Pa.**

CONCRETE HARDENER — Flintcrust compound is said to provide concrete with a case-hardened surface impervious to oil, grease, and other destructive chemicals. Features claimed are: It counteracts and prevents sanding and surface breakdown; and it prevents drag on

NEED STEAM?



LUCEY 104 H.P. 150 and 250 lb. W.P.
Skid mounted with 24" oil burning base.

LUCEY Inside Seal-Weld Double Calked BOILERS

1. 1040 sq. ft. heating surface.
2. 160 cu. ft. furnace volume.
3. Ample steam volume 54 cubic feet.
4. Oversize seamless firebox.
5. Butt straps calked and seal welded inside.
6. Four-inch water space around firebox.
7. Boilers available from 40 to 150 H.P. Working Pressures from 125 to 350 lbs.

Write for descriptive literature.

LUCEY BOILER and MANUFACTURING CORPORATION

CHATTANOOGA, TENNESSEE

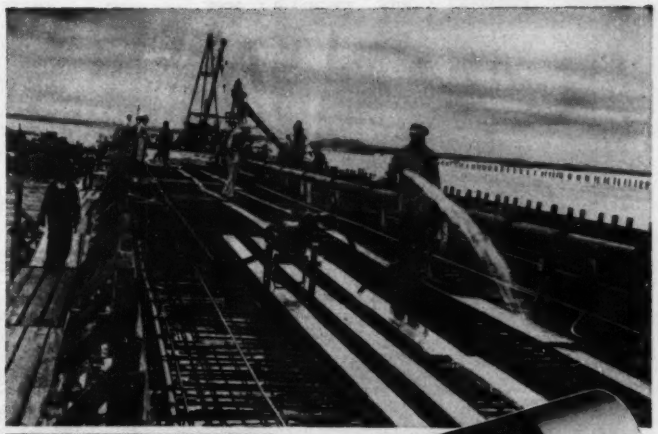
1514 CHESTNUT ST. CHATTANOOGA — LUCEY — 1312 STERLING BLDG. HOUSTON, TEXAS

SMOKE STACKS • BREECHINGS • FLY ASH REMOVAL UNITS
ASME UNFIRED PRESSURE VESSELS

material-handling equipment, facilitating mobility of vehicles. A liquid, Flintcrust is applied by flushing. Approximate coverage: ⅞ gal per 100 sq ft.—**Flexrock Co., Filbert & Cuthbert, W. of 36th St., Philadelphia 4, Pa.**

CONCRETE VIBRATOR—You just can't lose any grease from the bearings of this new Thor concrete vibrator, says its manufacturer, because of an exclusive steel sleeve around the vibrator unit. The new "521" has a steel cylinder 2¾ in. dia. and is 17½ in. long, at the end of a 5-ft length of combination air and exhaust hose. This latter is replaced with optional 10-, 15-, and 20-ft lengths, if desired. Additional features include a roll-type throttle providing up to 8,000 vibrations per min, as well as an adjustable automatic air line oiler.—**Independent Pneumatic Tool Co., Sales Promotion Dept., 175 N. State St., Aurora, Ill.**

UTILITY SPRAY TANK—The basic operations performed by a large distributor handling bituminous materials are: Loading material from an outside source; circulating it while heating; spraying through various lengths of bar; and transferring material from one point to another without entering its own tank. For several thousand dollars less than the cost of a big distributor, the "101 Utility Spray Tank" is said to perform all these functions as well as any others which can be accomplished with a heating kettle and motor spray attachment. Available in three types: single axle trailer (with 400- and 600-gal capacity) two-axle trailer and skid type without trailer for mounting on truck chassis or flat-bed truck.—**Littleford Bros. Inc., Cincinnati 2, Ohio.**



STRONGER Where Strain is Greatest!

STYLE R-35

U. S. Patent No. 1948410

"NEWTYPE" SUCTION HOSE

A GOODALL *"Standard of Quality"* PRODUCT FOR CONTRACTORS

Special reinforced ends give added strength and resistance to flexing wear back of the couplings, and provide a sturdier, more durable section under the clamps. Ends are colored in bright red for easy identification.

Kinkproof construction assures full-capacity bore under suction and discharge, always . . . the hose will not buckle or collapse. If accidentally crushed by heavy equipment, it can be rounded into shape again with mallet or hammer.

Extreme flexibility, with comparative lightness in weight, makes "NEWTYPE" easy to handle, even in longest lengths.

Inseparable bonding of tube, carcass and cover, by patented process, insures extra long service life under severest working conditions.

PARTICIPATING IN MANAGEMENT AND FINANCING OF KENTUCKY SYNTHETIC RUBBER CORPORATION

Made in 1" to 1½" I. D. in maximum lengths of 100 feet, and 2" to 4" I. D. in maximum lengths of 50 feet.

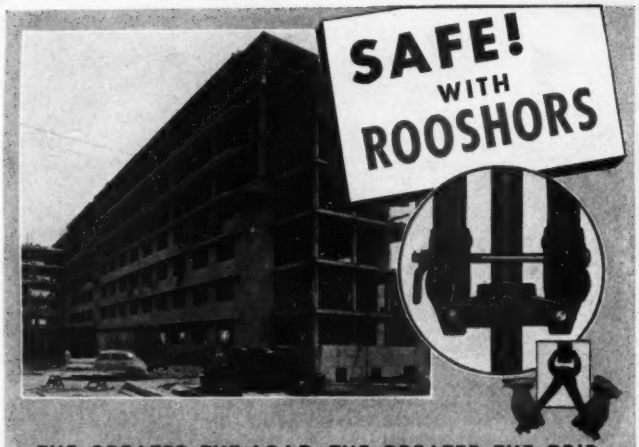
Contact Our Nearest Branch for Further Details and Prices

GOODALL RUBBER COMPANY

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

Branches: Philadelphia · New York · Boston · Pittsburgh · Chicago · Detroit · St. Paul · Los Angeles · San Francisco · Seattle · Portland · Salt Lake City · Denver · Houston · Distributors in Other Principal Cities

Est. 1870



THE GREATER THE LOAD, THE GREATER THE GRIP

The Rooshor Lock acts like a pair of monster tongs assuring absolute safety. At all times the pressure is three times as great as is necessary to prevent slipping. Rooshors have no loose parts such as pins or wedges to become lost. Rooshors fit every job and are easily handled by one man. They are instantly adjustable within their three ranges of sizes: 8 ft. to 14 ft.; 7 ft. to 13 ft.; and, 5 ft. to 9 ft.—higher stories are shored with the Roos Extension Shore.

Clamp Columns *Quicker*
with Roos Column Clamps

Roos Column Clamps are faster and save contractors money because they *cannot be put on wrong* (no rights and lefts)—thereby eliminating lost time and motion in fitting and adjusting. They automatically square the column and have no loose parts to come loose causing needless delays.

For Prompt Service—Rooshors and Roos Column Clamps are available for rental from warehouse stocks in principal cities from coast to coast.

Write for Bulletin 151

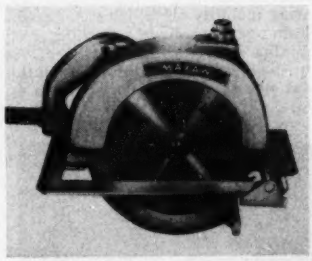
BAKER-ROOS, INC.
602 WEST McCARTY STREET
INDIANAPOLIS 6, INDIANA

Stang **WELLPOINT SYSTEM**

For KNOW HOW • ENGINEERING • SUPERVISION • EQUIPMENT to keep jobs DRY

The Stang System has proved its efficiency and economy on both large and small jobs all over the United States. Stang engineering and supervision in planning, installation and operation insures a DRY JOB at all times.

JOHN W STANG CORPORATION
2 Broadway, New York 4, N. Y. — 2133 S. 56th St., Omaha, Nebr. — 8333 Atlantic Ave., P. O. Box 611, Bell, Cal.



PORTABLE 8-IN. SAW—Eight-inch Maxaw cuts 2⅝ in. on a square cut; 2 3/16 in. at 45 deg. The motor is a universal ac/dc, 115-v special with a no-load speed of 4,600 rpm. It has a double-pole momentary contact switch with a 100% overload capacity. Standard equipment includes an 8-in. combination blade, wrench, and rip-fence guide.—**Fred W. Wappat Div., Cummins Portable Tools, Mayville, N. Y.**

VERTICAL MOTOR — Available in ratings from ¾ to 5 hp, new vertical solid-shaft capacitor motors are announced with principal application on jet pumps and other assemblies for supplying water. Base is same dimension as on polyphase motors, permitting interchangeability without modification of the mounting.—**General Electric Company, Schenectady 5, N. Y.**

MATERIAL-HANDLING TONGS — Container tongs are designed for handling small, heavy loads such as blocks or cartons of materials. The G-W tongs have a maximum dimension of 10½ in. The flat, serrated pressure plates are said not to mar the surface of material carried.—**Gifford-Wood Co., Hudson, N. Y.**

TRACTOR-MOUNTED SNOW PLOW — Rotary Sno-Flyr plow mounts on Caterpillar D7 crawler tractors. Power to drive plow and rotors comes from two engines mounted on a special counterbalancing platform at rear of tractor. Center of gravity of the tractor is shifted only 1 in. Diesel or gasoline engines with 200 or more hp may be used. The Sno-Flyr features two hydraulically powered 360-deg revolving casting chutes. The moldboard clears a 9-ft swath.—**Wm. Bros Boiler & Mfg. Co., 1057 Tenth Ave., S. E., Minneapolis 14, Minn.**

SIMPLIFIED

Austin Overshot Loader

Check these outstanding features:

Drive...simple, positive; no cable or hydraulic drives; wears longer.

Front Power Takeoff...gives live bucket without master clutch being engaged; accurate control; easier to operate.

Mounts on Main Frame of Tractor

Doesn't Interfere With Servicing of Tractor

Pre-Assembled...entire drive unit is assembled and adjusted at factory—ready for you to put on.

Doesn't Interfere With Drawbar

Automatic Control...bucket stops automatically in dumping position.

Brake Control...hydraulic brake on rear spool shaft to control speed of bucket return.

Uses No. 24 Cat P.C.U.

Good Visibility for Operator

Easily Converted to Dozer in 20 Minutes

SPECIFICATIONS

MODEL 6 C

Fits wide gauge, non-oscillating D6, without modification. Wide gauge, oscillating D6 can be modified to accommodate the 6C.

Standard Bucket Capacity in cubic yards (rated) 1½

Bucket width .....6'	Overall height.....18' 4" (bucket raised)
Overall width .....9'	Overall length.....20' 8" (bucket lowered)
No. of bucket teeth.....6	Loading cycle (seconds) 15
Dumping clearance..8' 1"	Weight (approx. pounds) 9,500
Overall height.....8' 2" (bucket lowered)	

EXPORT DIVISION
P. O. Box 5043 Terminal Annex
Denver 17, Colorado

JOHN AUSTIN, INC.

2 SANTA FE DRIVE
DENVER, COLORADO

Printed in U.S.A.

When Choosing V-Belts Remember These Two Words ...They Mean Exactly What They Say!

"DEPENDABLE RUGGEDNESS" didn't get into the BWH trade mark by accident. It means *precisely* what it says . . . Bull Dog V-Belts assure steady, smooth, low cost power transmission — *uninterrupted by premature belt failure.* You save on maintenance costs, keep the wheels of power moving!

TOUGH PROBLEMS INVITED — Ask us or your nearest BWH distributor about your power transmission belting, conveyor belting and hose problems. We're specialists in making mechanical rubber products work *better, longer.*

- **SPECIALLY ENGINEERED BWH CORD SECTION**
  Noted for high tensile strength. *Benefit:* superior load carrying capacity, ability to absorb shock loads, uniform matching when used in sets.
- **MINIMUM STRETCH**
  Results from a new, exclusive technique in processing Bull Dog Cords. *Benefit:* reduced slippage, a minimum of adjustments, longer belt life.
- **DURABLE COVERS**
  The secret's in the closeness of weave of the heavy, bias cut fabric. *Benefit:* it can take the severe wearing action of the sheave while sealing the belt against moisture, dirt and grease.
- **WITHSTANDS SEVEREST FLEXING**
  The "reason why" here is due to constant research in the development of quality - controlled compounds by BWH. *Benefit:* these compounds run cooler and do not crack or deteriorate under severe flexing.

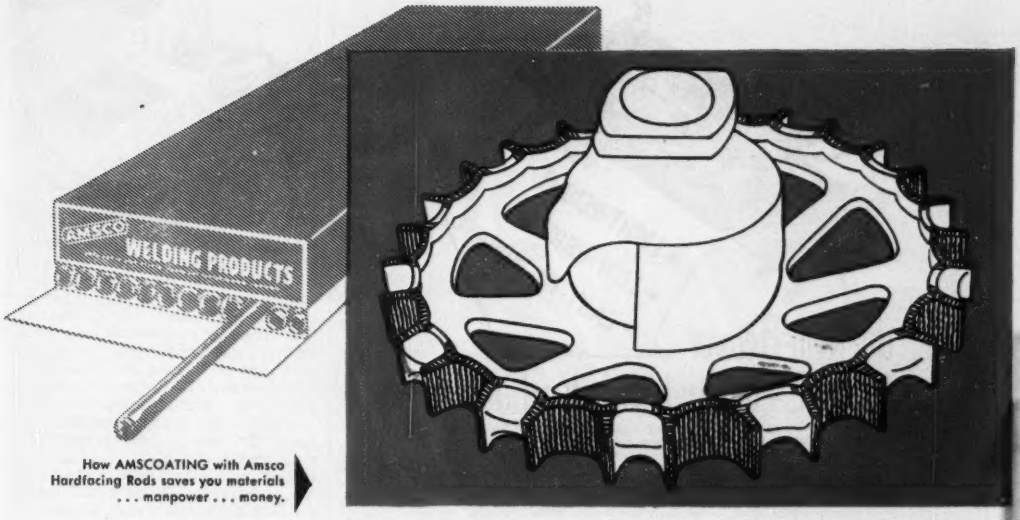
For these reasons make your next V-Belt purchase order read "Bull Dogs" — and buy them by the set!

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS. • P. O. BOX 1071, BOSTON 3, MASS., U. S. A.



How AMSCOATING with Amsco Hardfacing Rods saves you materials . . . manpower . . . money.

These teeth take bites out of repair costs!

AMSCOATING can make old Tractor Drive Sprockets last 3 times longer than new.

Here's another way to beat the high cost of replacements, down-time and maintenance . . . AMSCOATING the teeth on Tractor Drive Sprockets. Time after time service records have shown that AMSCOATING of sprockets results in these dollar-saving advantages:

1. ***On an average — 3 times the service life of a new, unhardfaced sprocket.***
2. ***2 out of 3 sprocket changes completely eliminated . . . far less down-time, less maintenance . . . more equipment out of the shop and on the job.***

To top it off, sprocket replacements can practically be eliminated. An AMSCOATED sprocket can be reclaimed over and over again . . . *at about half the cost of a new one!*

Get all the facts on how to make these big savings . . . write today for instruction sheet on AMSCOATING sprockets, and the name of your nearest AMSCO Distributor.

AMSCOATING...stands for control of wear by Hardfacing...

Hardfacing rods—and recommendations for their use—are as sound as the manufacturer who makes them. AMSCO has been fighting wear for a half-century—first with Manganese Steel, and later with AMSCO Hardfacing Products.

If you have a problem of wear caused by impact, abrasion, heat or corrosion . . .

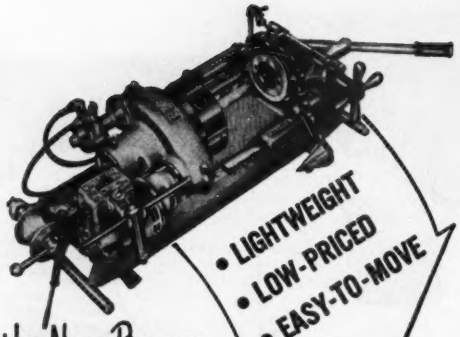
Find out how AMSCOATING can save you materials . . . manpower . . . money!

AMSCOATING
THE RIGHT WAY TO SAY HARDFACING

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
385 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que.
Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.



the New Beaver
Model-E Pipe and Bolt Machine

The new low-priced, lightweight Beaver Model "E" is a "junior edition" of the heavy-duty Beaver Model A—which has, for the past 20 years, been the recognized leader in the field of portable pipe and bolt machines.

Although designed primarily for hardware stores and small piping contractors and industrialists, BIG contractors will find the new Model "E" useful on jobs requiring extreme portability.

A pipe machine is no better than the service back of it and our 50 years of experience in this field, and our reputation for high quality and friendly service, is your best guarantee of complete satisfaction.

PRICE $385.00. WRITE FOR BULLETIN E.

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PIPE TOOLS
228-300 DANA AVENUE . WARREN, OHIO, U. S. A.

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Acker Soil Sampling Kit gives you accurate sub-surface information *Quickly— Easily— Inexpensively*

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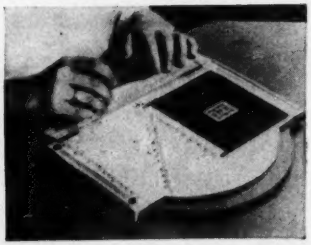
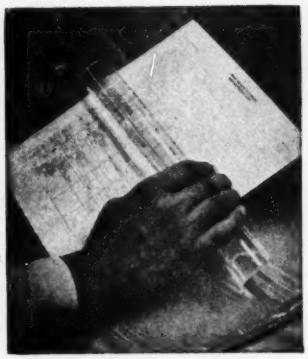
ACKER DRILL CO., INC., SCRANTON 3, PA.
Over 30 years of experience in the manufacture and development of drilling equipment

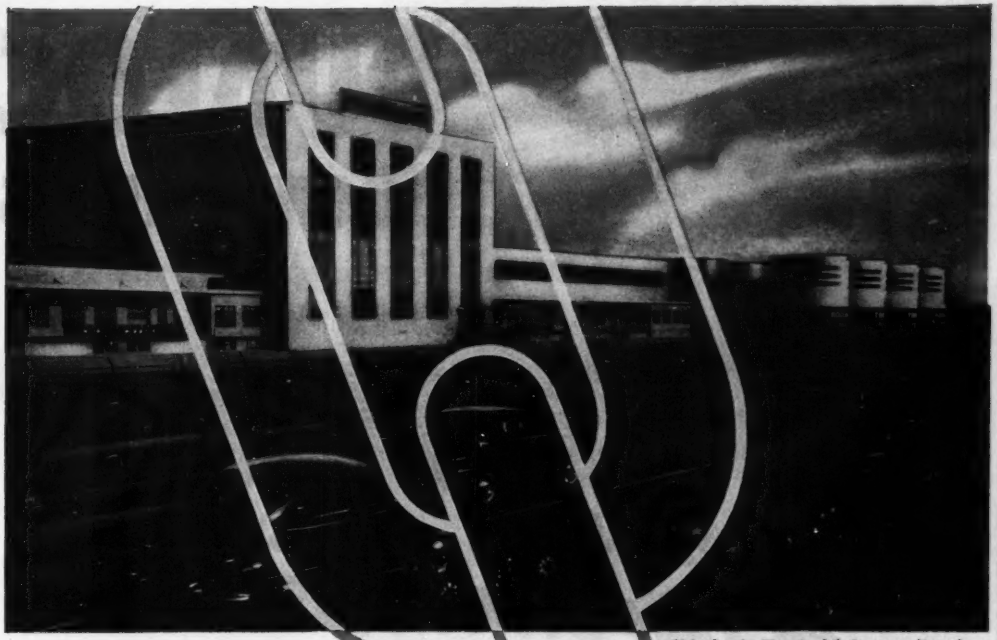


MATHEMATICAL CALCULATOR—Made of Vinylite plastic, the Merrill RMS Slide-Disk desk calculator is said to be accurate to ½%. One operation completes as many as five separate mathematical steps. Squares, sums of squares, and square roots are performed simultaneously. It can be used to determine standard deviations, root-mean-squares, correlation coefficients, geometric and harmonic means, regression lines, and similar functions. Linear and logarithmic scales are furnished with the calculator.—**Graphic Calculator Co., 633 Plymouth Court, Chicago 5, Ill.**



MAGNIFYING VIEWER—Rectangular reading instrument magnifies images making it easier to read small lettering and type. Made of a transparent plastic material, it is available in various lengths to suit specific applications. The 2X MagnaVue instrument features pre-focused double magnification. — **The Alston Corp., P. O. Box 146, Hollydale, Calif.**

JACK FOR PRESSURE GAGE—The job of checking pressures in vise jaws, clutch assemblies, crowd mechanisms, moving rollers, etc; with a Dillon Pressure Gage has been simplified by a new jacking assembly. The mechanism, by its structure, permits perfectly square application of loads and compressive forces. Only minimum effort is needed on handles which fit into holes in adjustment nut. Parts are all plated and hardened, and reading is in pounds.—**W. C. Dillon & Co., Inc. 1421 S. Circle Ave., Forest Park, Ill.**



Cities Service Terminal & Compounding plant, Chicago, Illinois

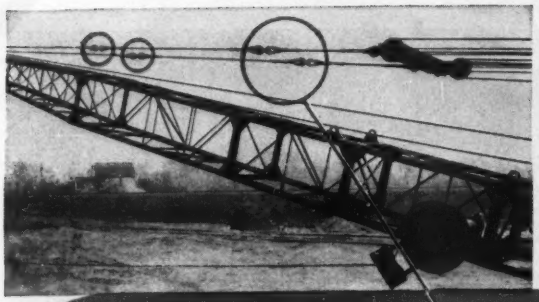
Newest link of PROGRESS

NOW!...The *newest...finest...* *most modern* plant for compounding and packaging lubricating oils

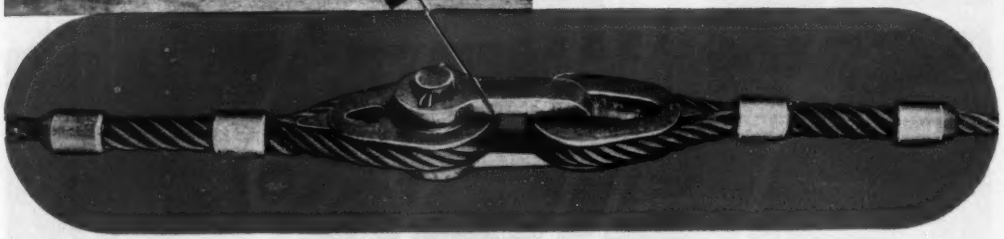
Month by month you see the proof piling up of still more Cities Service growth... strength . . . progressiveness. Now the latest Cities Service facilities have been added in Chicago's Cicero district. Here a completely modern 25-million-gallon plant is in full operation today, to serve you with lubricants of characteristic Cities Service quality.

The size of this complete plant...its rail and water transport advantages...and the excellence of its output signify the progress Cities Service is attaining throughout its marketing area. Cities Service has been progressive and will remain so, always striving to provide its dealers...its customers...with the finest petroleum products made.

CITIES SERVICE



DUALOC
BOOM CABLES



ONLY the New DUALOC gives you these

4 IMPORTANT ADVANTAGES—

1 **PREVENTS FATIGUE FAILURES.** Complete flexibility with Double Hinging action. No place for hidden and unexpected failures to happen from vibration.

2 **COMPLETE, ACCURATE INSPECTABILITY.** No wrappings, tapings or solderings. Completely open for inspection at any time. You can always know the exact condition of your Boom Cables.

3 **COMPLETE ADAPTABILITY.** Endings have same dimensions as zinced sockets—can be installed without alteration to present equipment.

4 **NO LOWERING OF WIRE ROPE STRENGTH.** Strength in all parts equal to full catalog strength of the wire rope. You have all the advantages of these assemblies with full assurance of all the strength built into your equipment by the manufacturer.

DUALOC Boom Cables are ACCO-Registered. This is assurance of highest quality workmanship combined with top quality material—Preformed Green Strand Improved Plow Steel Wire Rope.

Write for this folder which gives more detailed information

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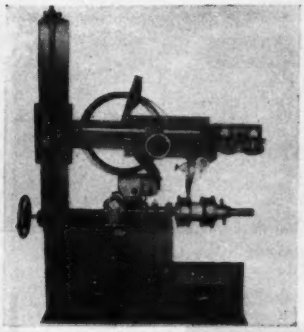
AMERICAN CHAIN & CABLE
WIRE ROPE SLING DEPARTMENT

TRADE MARK

In Business for Your Safety

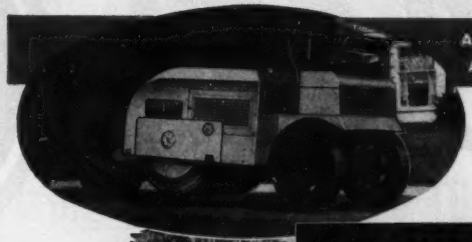
DUALOC BOOM CABLE ASSEMBLIES

PORTABLE PIPE THREADER—If you're currently using a set of standard die stocks for threading pipe on the job or in the shop, you can use them in this new lightweight portable power pipe threader called the Port-A-Pony. Developed for threading ¼- to 4-in. pipe, the machine weighs only 26 lb, and is easily handled by one man. Powered by a reversible ½-hp 110-v ac or dc motor it cuts threads anywhere that there's a 12-in. working area, according to its manufacturer. Because of its ability to work in small places, it's highly adaptable for cutting stationary pipe in narrow ditches, well pits, trenches, or in overhead areas within 5 in. of any wall.—**Thread-Exy Mfg. Co., Corunna, Mich.**



AUTOMATIC WELDER — Line of automatic welding and positioning equipment is designed for rebuilding tractor idlers and rollers, shovel rollers and shafts, crusher cones, and similar equipment. It utilizes the submerged arc principle of automatic welding, and an ac transformer-type welding machine in conjunction with a work positioner that handles parts weighing up to 750 lb and whose diameter is not less than 4 in. or greater than 36 in.—**Mir-O-Col Alloy Co., Inc., 312 North Ave. 21, Los Angeles 31, Calif.**

GALION VARIABLE WEIGHT PORTABLE ROLLERS



ATTACH AND TRANSPORT AS EASILY AS A TRAILER!

PROFITABLE TO USE

With the GALION Portable Roller you get outstanding features such as . . . hydraulic steering . . . rugged spur gear drive . . . variable weight . . . constant-mesh transmission . . . large diameter compaction roll . . . 42" rolling width . . . 25 h.p., 4 cylinder gasoline engine. No other roller of equal compaction efficiency is so easy to transport from job to job. Ideal for maintenance work and miscellaneous rolling jobs.

Write for literature.

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MOTOR GRADERS • ROLLERS

THE GALION IRON WORKS & MFG. CO.

General and Export Offices — Galion, Ohio, U. S. A.

Cable address: GALIONIRON, Galion, Ohio

Big Red TD 24

ANOTHER BIG BITE is dumped by the shovel and Big Red goes into action, grading the dirt down the hillside to carve out a workbench for the shovel. Teamwork is essential when shovel and tractor work together. And you always want Big Red on your team.

INTERNATIONAL

INTERNATIONAL HARVESTER

POWER THAT PAYS

Takes a Big Bite!

How International's Big Red Champ... the TD-24... Tackles 40 Feet of Solid Earth and Rock

Bring on your big tough jobs! Mass up the earth and rock. Then pass the word for "Big Red"—International's Champion of crawlers.

In the heart of the West Virginia mountains, Joe Troitino is stripping more than forty feet of earth and rock overburden to bare a rich four-foot seam of coal.

With the Big Red Champ on the job, Troitino strips about 450 tons of coal a day, and it's only one of his three coal stripping jobs!

"My company now owns six International TD-24s," says Troitino. "We think it is the best tractor on the market—and we have used all sorts of them under all kinds of conditions!

"Of course, I like the International TD-24 because it is easy to run, but, above everything else, we like it because it is more economical to operate than any other tractor we have ever used and because there is no rock or earthmoving job too tough for it."

The word is out. On the more rugged jobs, contractors who know crawlers are telling each other about the power and smooth action of the Big Red TD-24. Get the real low-down from your International Industrial Distributor. Ask him to show you Big Red in action—you'll be a TD-24 man from then on in!

International Harvester Company, Chicago 1, Illinois

IT TAKES THE CHAMP to pile into a drift of heavy dirt with the speed and drive needed to move it out of the way. Big Red and its big bites make passes fast, keep the load moving. With the TD-24 synchro-mesh transmission, instant high-low range shift and Planet Power steering, watch how the pay-dirt flies!

New!

A COMPLETE LINE OF

STOW

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VIBRATORS

SUPERIOR PERFORMANCE — thru improved design; higher operating speeds; lighter weight, heavy duty flexible shafting; shorter, more efficient vibrator heads.

MORE UTILITY — new STOW design permits tool shafts to be quickly, easily attached to the engine shaft for grinding, buffing, drilling. Complete accessories available.

THE RIGHT VIBRATOR FOR THE JOB. You'll find just the unit you need in this newly designed, **complete** line!

Send for Bulletin 511

Catalogs all STOW vibrator models and accessories. Gives performance data. Write today for your FREE copy

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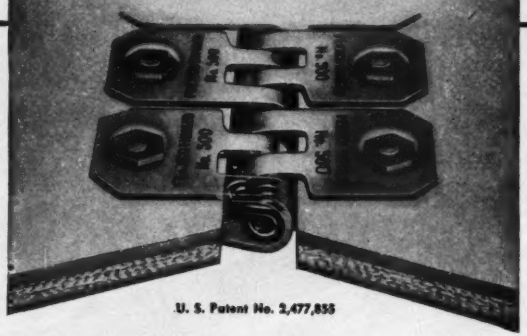
FLEXCO HINGED

BELT FASTENERS

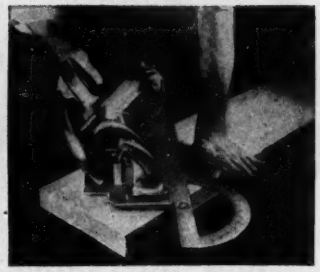


U. S. Patent No. 2,477,855

- For joining grader, trencher, ditcher and other earth moving conveyor belts.
- For belts 3/16" to 1/2" thick.
- A FLEXCO fastener that is HINGED. Has removable hinge pin.
- Troughs naturally, operates through take-up pulleys.
- Strong, durable . . . pull or tension is distributed uniformly across joint.

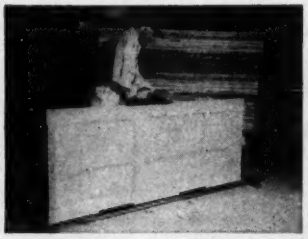
Order From Your Supply House. Ask for Bulletin HF 500.

FLEXIBLE STEEL LACING CO. 4699 Lexington St., Chicago 44, Ill.



SAW PROTRACTOR—Guide for power sawing consists of a straight edge segment clearly calibrated in units of 1 deg, and an easily movable holding arm. Desired angle is set by loosening a wing nut on the under side of the holding arm. In operation, side of shoe of the power saw is lined up with the protractor's straightedge, and the saw advanced along this edge.—**The Black & Decker Mfg. Co., Towson 4, Md.**

DRAINAGE CALCULATOR—Slide-rule is set up to determine right size and shape of drainage structures for specific applications. Knowing run-off index and number of acres to be drained, a single setting of the slide determines required cross-section of structure and indicates the correct size of round pipe, Pipe-Arch, and Multi-Plate pipe and Pipe-Arch. A table listing arch dimensions enables selection of an arch with suitable span and rise. Calculations are based on Talbot's formula with a maximum rainfall of 4 in. Corrections for other rates are made by a movement of the slide.—**Armco Drainage & Metal Products, Inc., Middletown, Ohio.**



PORTABLE DOOR JACK—Lightweight door jack features folding construction, runner guides along the spine, rubber gripper feet, rubber bumper at nose, adjustable clamp-grip on the upright member, and non-mar protection for both work and work area. The Adjusta-Fold handles all standard doors up to 8 ft. Doors may be worked with hinges in place. A center disconnect pin permits handling window sash, shutters, and small cupboard doors. Fully extended, the jack measures 7½ ft. Upright member is 18 in. Weight is 11 lb.—**E-Z Mark Tools, 3707 S. Robertson Blvd., Los Angeles, Calif.**

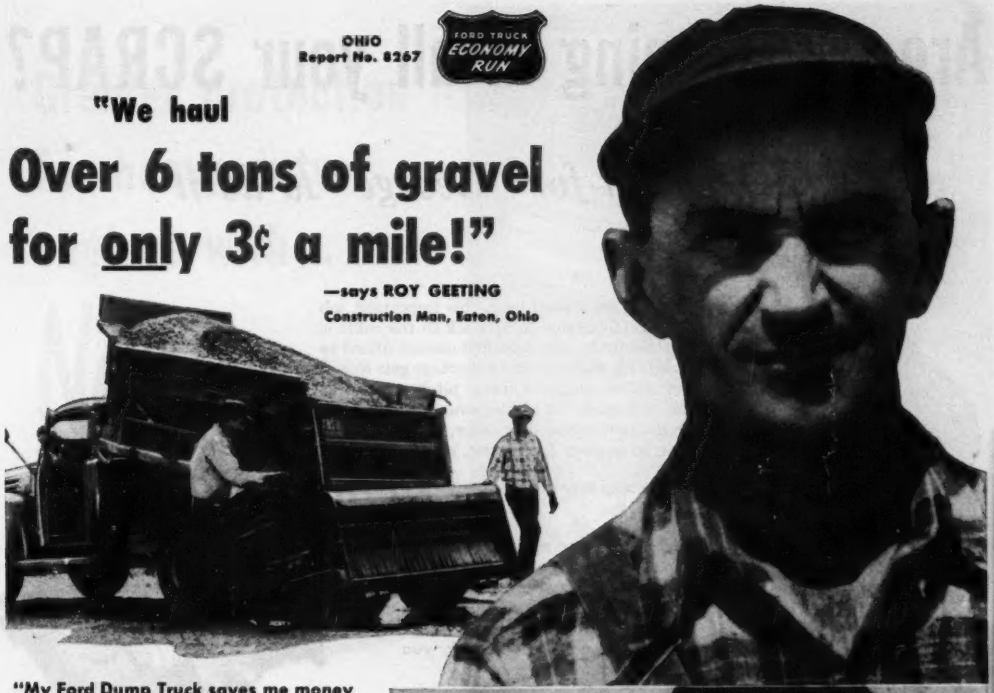
OHIO
Report No. 8267

FORD TRUCK ECONOMY RUN

"We haul

Over 6 tons of gravel for only 3¢ a mile!"

—says ROY GEETING
Construction Man, Eaton, Ohio

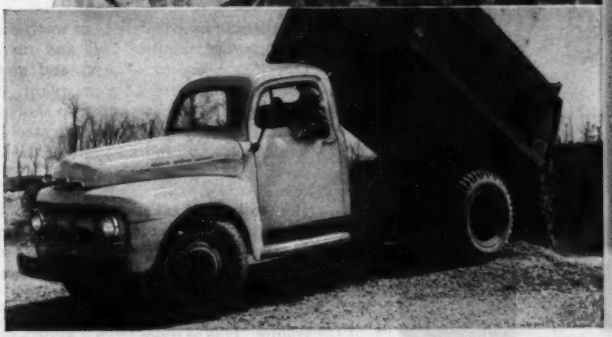


"My Ford Dump Truck saves me money every mile," says Mr. Geeting. "I save about a dollar a day or almost 300 dollars a year on gasoline alone!"

Contractor Geeting uses his 1950 Ford F-6 Dump for all kinds of roadwork (i.e., hauling sand and gravel, sanding hills, plowing snow). He says, "It's the ideal truck for cramped quarters because it steers and handles so easily."

He entered his truck in Ford's nation-wide Economy Run and says: "My Ford traveled 21,003 miles with loads of over 6 tons. Yet it cost only $637.83 for gas, oil, maintenance and repairs. That's a running cost of only 3.04 cents a mile!"

Like others who rely on Ford for low running costs, Roy Geeting is sold on the money-saving service he gets from his Ford Dealer. For more facts on the trucks that last longer *and* save you money every mile—mail coupon below.



This Ford F-6 Dump for '51, like Mr. Geeting's truck, is a favorite with construction haulers. Power choice of 3 great engines . . . 100-h.p. V-8, 110-h.p. Big Six and 95-h.p. Six. Available with the 5-STAR Cab, or, at added cost, the 5-STAR EXTRA Cab for more efficient driving, safety and convenience. Single speed rear axle standard, 2-speed axle also available (at extra cost) with wide range of ratios for operating flexibility.

Availability of equipment, accessories and trim as illustrated is dependent on material supply conditions

POWER PILOT HELPS CONSTRUCTION MEN HOLD DOWN HAULING COSTS

The Ford Truck Power Pilot is a simpler, fully-proven way of getting the most power from the least gas. It is designed to synchronize firing *twice* as accurately.

You can use regular gas . . . you get no-knock performance. Only Ford in the low-price field gives Power Pilot Economy.

FORD TRUCKING COSTS LESS

because FORD TRUCKS LAST LONGER!

Using latest registration data on 7,318,000 trucks, life insurance experts prove Ford Trucks last longer!

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Send me without charge or obligation, detail specifications on Ford Trucks for 1951.

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Light Models ☐ Extra Heavy Duty Models ☐

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(Please print plainly)

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City _____ Zone ____ State ____

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Are you turning in all your SCRAP?

Don't wait for "George" to do it

IF you are a steel user, this important job of getting more scrap back to the mills is directly up to *you*. You just cannot afford to sit idly by while the scrap shortage gets worse. For unless everyone really pitches into this job of digging out all the scrap possible, steel production is bound to suffer, and every steel user, in more or less degree, will suffer too.

More scrap means *more* steel—it's as simple as that.

Right now some mills have only a bare two-days' supply of scrap on hand. Others have even less. Some steel-making furnaces already have had to shut down for lack of scrap. The situation is serious. Only you can help improve it.

By turning in every piece of worn-out equipment, every obsolete tool and machine, in fact every pound of iron and steel scrap you can comb out of your plant, you'll be helping relieve the worst scrap shortage since Pearl Harbor days . . . and the steel industry will be able to produce more of the steel you need.

Remember—it takes at least one-half ton of scrap to make one ton of steel. To maintain steel's present high production schedules requires more than 1400 carloads of industrial scrap *every* day. So turn in your scrap—ALL your scrap—and keep the mills rolling. This is more than a shortage. It's an emergency that vitally concerns you—and us—and the Nation.

You'll find your local scrap dealers listed in the yellow pages of the phone directory.

This page would ordinarily be used to tell you about

AMERICAN TIGER BRAND WIRE ROPE

but, because without SCRAP we cannot produce steel, we are asking instead for your all-out help in getting more SCRAP to the mills.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

1-1348

UNITED STATES STEEL

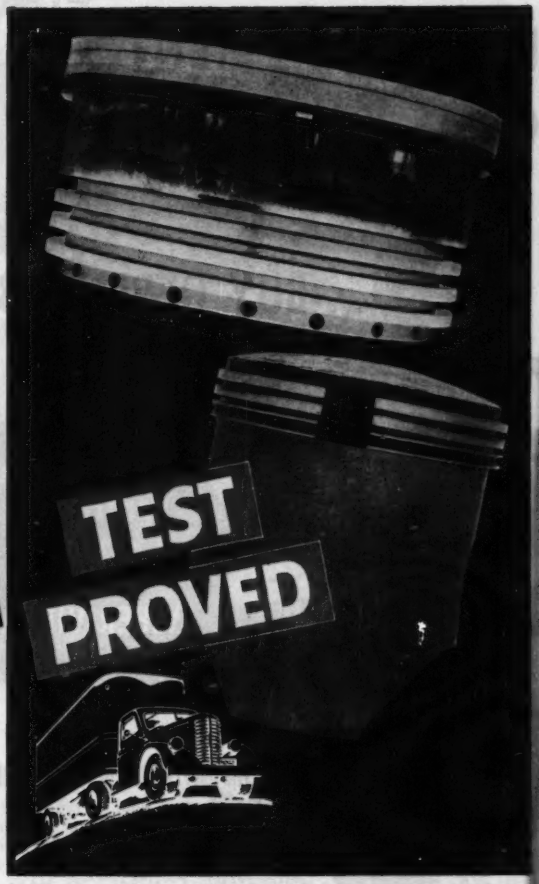
Greater protection for heavy-duty engines with . . .

New and better . . .

STANOLUBE HD-M

REG. U. S. PAT. OFF.

Motor Oil



● Take a close look at the pistons shown in these unretouched photographs. They give graphic evidence of the superior protection new STANOLUBE HD-M Motor Oil offers in automotive diesel and heavy-duty gasoline engines.

The larger of the two pistons was taken from a diesel test engine after 480 hours operation (the Caterpillar No. 1-A Test) and shows clean, deposit-free ring grooves. The smaller was removed after test in a gasoline engine (the Chevrolet 36-hour Test) and reveals no varnish-like deposits on the piston skirt.

Here's graphic proof of two important properties of this new motor oil: improved detergent-dispersant action and greater oxidation stability. These two properties, proved by laboratory tests and confirmed in extensive field service, mean superior protection under the most severe conditions of high operating temperatures and prolonged periods of operation.

New STANOLUBE HD-M Motor Oil offers these two properties in addition to the same qualities of corrosion resistance and freedom from foaming which helped make STANOLUBE HD a preferred lubricant for heavy-duty applications during the past nine years. To make the best use of this new and better motor oil, ask for the services of the Standard Oil lubrication specialist in your area. Phone your local Standard Oil Company (Indiana) office or write Standard Oil Company (Indiana), 910 South Michigan Ave., Chicago 80, Illinois.

A Complete Line of Motor Oils for Every Heavy-Duty Service Need

STANOLUBE HD-M is recommended for all internal combustion engines. It meets U. S. Army specification MIL-0-2104. This lubricant provides excellent cleanliness, low wear rate, and low oil consumption under severe operating conditions. Available in all SAE grades.

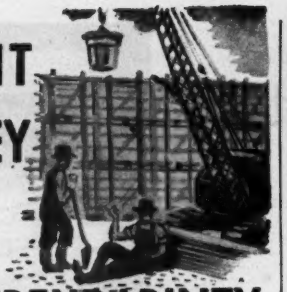
STANOLUBE S-1 is recommended for use in automotive, diesel, or gasoline engines where other heavy-duty oils cannot control deposits caused by operational severity or adverse fuel quality. It meets requirements of MIL-0-2104 and the requirements for "series 1" type oils as well. Available in all SAE grades.

STANOLUBE HLA is recommended for use in supercharged diesel engines and in other engines that operate under the most adverse conditions. It meets the requirements of MIL-0-2104 and the requirements of "series 2" type oils. Available in SAE 10 and 30 grades.

STANDARD OIL COMPANY (INDIANA)

STANDARD

IDLE EQUIPMENT COSTS YOU MONEY



BUY DEPENDABILITY

successful contractors use
LONG-LIFE
VIBER VIBRATORS

THE DIFFERENCE BETWEEN PROFIT and LOSS

The constant fight to maintain production schedules is a headache to every contractor. Breakdowns at a crucial point can mean the difference between making or losing money. SUCCESSFUL CONTRACTORS HAVE FOUND DEPENDABLE EQUIPMENT CAN MAKE THE DIFFERENCE.

Dependable equipment offers the maximum in working hours with the minimum of trouble. Viber's careful selection of the finest materials and years of experience in producing only concrete vibration equipment has proved DEPENDABILITY.

VIBER VERSATILITY

Viber engineers have designed a complete line of concrete vibrators that can be interchanged on the job. This helps eliminate costly delays and keeps production working smoothly. It also makes equipment last longer because only worn out parts have to be replaced . . . not entire units.

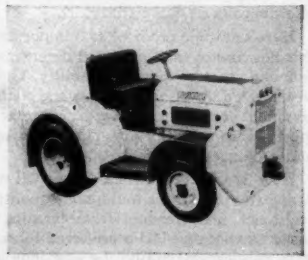
Consider Operating Efficiency . . . Reputation . . . Price and BUY VIBER VIBRATORS

VIBER COMPANY
CONCRETE VIBRATORS SINCE 1931

726 South Flower St., Burbank, Calif. Dept. 19

IMPROVED SNOW-CASTING CHUTE — Hydraulically controlled revolving snow casting chutes can be aimed by the operator in any direction. Both chutes can be aimed in the same direction; or individually to any direction to take best advantage of wind direction or to place excess snow in the most desirable location. The chutes turn a full 360 deg, and are controlled from the cab by a hydraulically driven motor.—**Wm. Bros Boiler & Mfg. Co., 1057 Tenth Ave., S. E. Minneapolis 14, Minn.**

LIQUID WATER REPELLENT — Clear silicone base liquid water repellent for exterior masonry is recommended for use on concrete, concrete blocks, brick, stucco, mortar joints, unglazed tile, asbestos shingles, marble and stone. Manufacturer claims one application keeps water out of masonry for periods up to five years. Penetrating solvents which make up its content enter from 1/16 to 3/8 in. upon application. Unlike ordinary water repellents, however, it will not plug up pores or prevent transpiration of air. Coverage is estimated from 100 to 300 sq ft per gal depending upon porosity.—**The Chem Industrial Co., 1114 Hippodrome Bldg., Cleveland 14, Ohio.**



TORQUE CONVERTER SHOP MULE—Six-ton-drawbar-pull tractor with torque converter can be diesel or gasoline powered. The HA-120 Shop Mule has a single-stage closed-circuit-type torque converter. Features include 4-wheel hydraulic brakes, heavy-duty transmission with four forward and one reverse speed, 17-gal Protectoseal fuel tank, adjustable seat, and dual pneumatic-drive tires.—**The Buda Co., Harvey, Ill.**

JAHN
Heavy Duty
TRAILERS
ON YOUR WAY WITHOUT DELAY...
KEEP your equipment earning money! For fast, safe job-to-job transportation get the Jahn Heavy Duty Trailer in the size and model that meets your needs.
JAHN TRAILER DIVISION
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5 TONS TO 100
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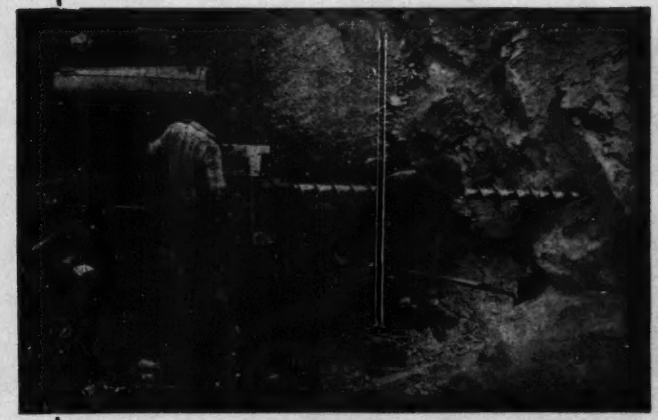
QUALITY PRODUCTS
THERE'S A JAHN TRAILER FOR EVERY HAULING NEED

Parmanco

HI-SPEED HORIZONTAL
DRILLS

New Traction Drive with Forward and Reverse

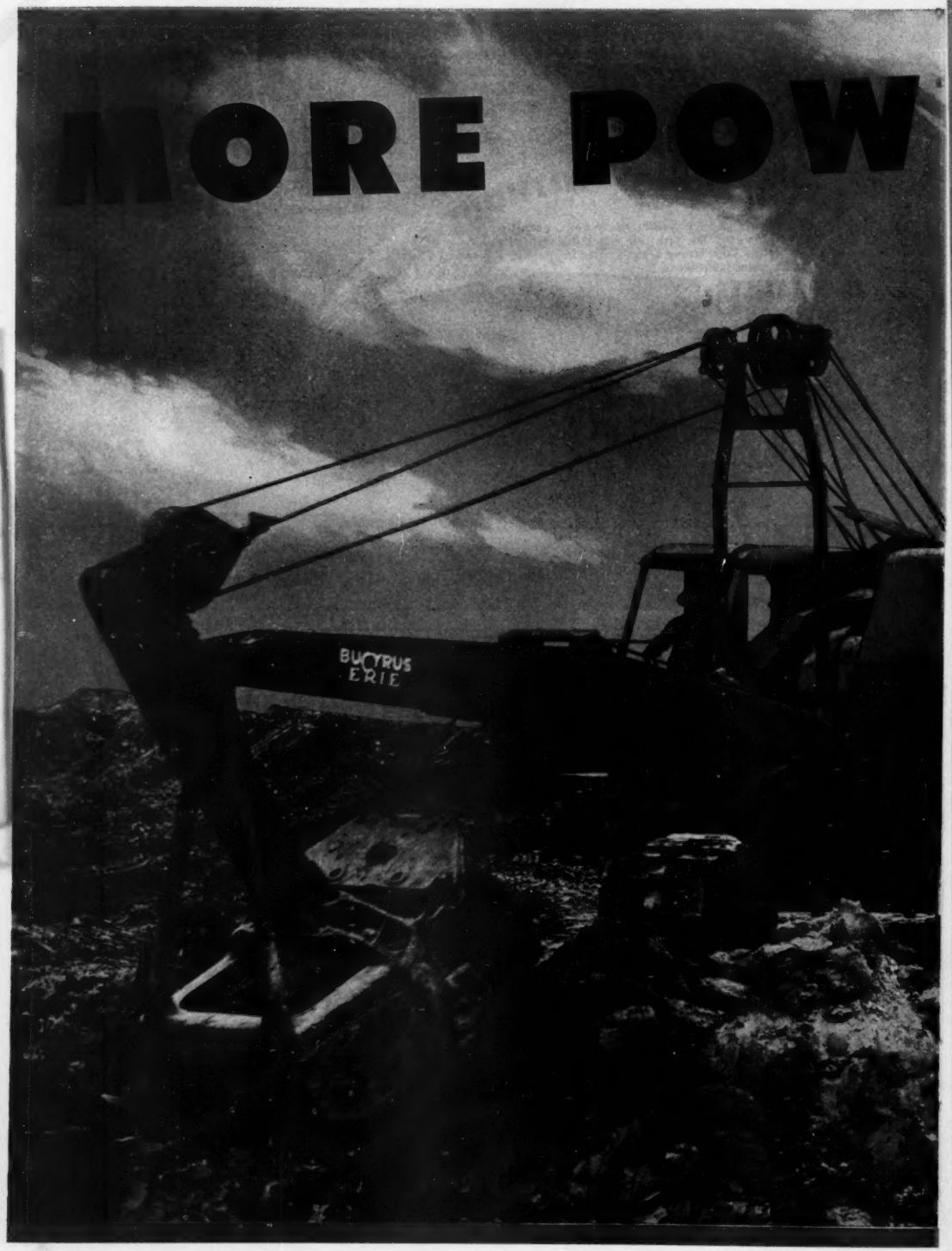


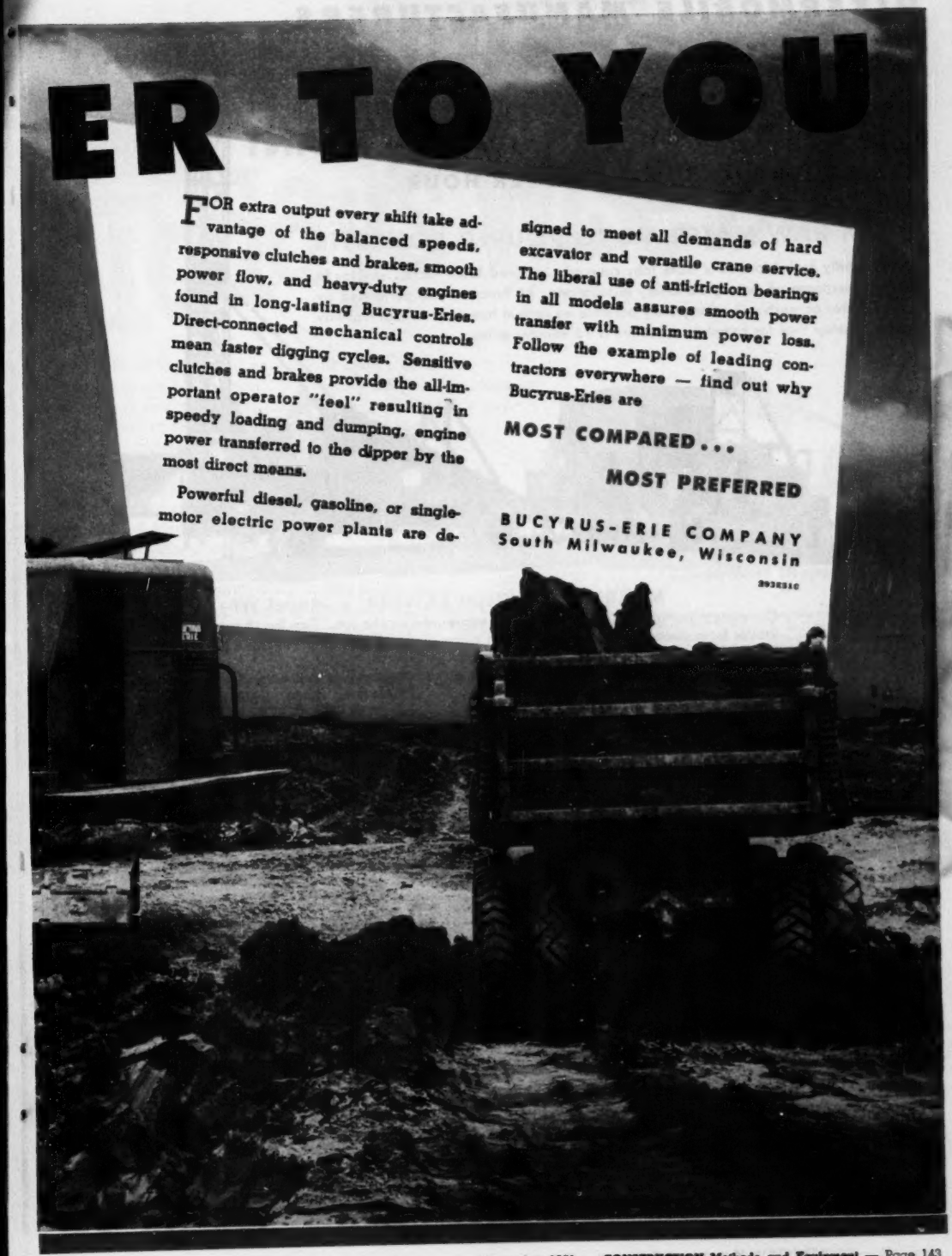
THIS UNIT IS DELIVERING *6-inch shot-holes* READY FOR LOADING *at better than* TWO FEET A MINUTE!!

The new Parmanco Hi-Speed Horizontal Drill is completely redesigned around a 40 h. p. engine with four drilling speeds which, in field tests, has cut one-third off the footage drilling time — a cost-per-drilling-foot saving that we are passing on to the strip mine operator and contractor at no increase in our price. In addition, the drill is equipped with a starter and generator, dual type front wheels, truck type rear axle with mechanical brakes and a traction drive with both forward and reverse.

• For both Mines and Construction

PARIS MANUFACTURING COMPANY • PARIS, ILLINOIS


MORE POW
BUCYRUS
ERIE


ER TO YOU
FOR extra output every shift take advantage of the balanced speeds, responsive clutches and brakes, smooth power flow, and heavy-duty engines found in long-lasting Bucyrus-Eries. Direct-connected mechanical controls mean faster digging cycles. Sensitive clutches and brakes provide the all-important operator "feel" resulting in speedy loading and dumping, engine power transferred to the dipper by the most direct means.
Powerful diesel, gasoline, or single-motor electric power plants are designed to meet all demands of hard excavator and versatile crane service. The liberal use of anti-friction bearings in all models assures smooth power transfer with minimum power loss. Follow the example of leading contractors everywhere — find out why Bucyrus-Eries are
MOST COMPARED . . .
MOST PREFERRED
BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

MIXERMOBILE MANUFACTURERS

completely *Portable* CONCRETE

- WEIGH BATCHING
- MIXING
- ELEVATING

PLANT

CAPACITY UP TO 50 CU. YDS. PER HOUR

FROM RAW MATERIALS TO POURED CONCRETE

This ruggedly built trio means more jobs covered...reduced labor costs...savings in time and expense of making stationary installations. All functions are performed by one operator on each unit. Completely portable equipment travels at normal highway speeds...setup time for complete operation is 15 minutes or less.

MIXERMOBILE WEIGH BATCHER • Model WB-1

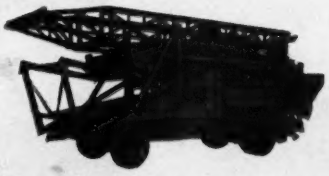
Completely portable unit weigh batches aggregate on the job. Can be charged with front end loader from storage piles or directly from dump trucks. Single operator sets up unit for operation in 15 minutes. Weigh batches up to 50 cu. yds. per hour.

- **Three 7 cu. yd. bins and 2 cu. yd. skip store up to 23 cu. yds. of aggregate.**
- **Charging skip hydraulically operated.**
- **Bin selector located by skip control directs skip.**
- **Equipped with either dial or beam scales.**
- **Weight, 17,800 lbs; height, 12 ft.; width, 8 ft.; overall length, 28 ft. (with skip down).**
- **Mounted all around on 8.25x20 tires.**

2-YD. MIXERMOBILE • Model M-7

Completely mobile concrete mixing and elevating plant eliminates cost of hauling and erecting expensive equipment. One man handles the entire operation from mixer to deck.

- **Improved batch-timer and counter insures positive mixing time.**
- **New electronic water meter gives unerring accuracy.**
- **Sturdy planetary drive hoist clutches give extra power, durability.**
- **Mixes up to 50 cu. yds. per hour.**



SCOOPMOBILE • Model C. The versatile Scoopmobile with exclusive planetary drive has 7 "quick change" attachments. Standard ¾-cu. yd. scoop bucket permits operator to keep Weigh Batcher unit performing to full capacity.

- **Loads and transports aggregate.**
- **Transports, elevates and pours concrete.**
- **Lifts and places form panels, timbers, etc., up to 4,000 lbs. capacity.**

ATTACHMENTS INCLUDE: Scoop buckets in various sizes, swivel and standard type concrete hoppers in ¾ cu. yd. capacities, lift forks, crane boom, track extensions with braces up to 26 feet overall.

Write for literature and address of your nearest dealer.

Mixermobile Manufacturers reserve the right to make improvements in design and specifications without notice.

MIXERMOBILE MANUFACTURERS

WAGNERMOBILE

Box 7527 • Portland 20, Oregon

MACK TRUCKS...

Today's Wise Buy

Now, more than ever, it pays to look upon your truck purchase as an investment...one that should yield you long-term dividends in dependability and economy. Measured that way, you'll find there's no other truck to match a Mack.

Long-lasting, profit-making Mack performance is well demonstrated by Mack Model A-40 Series (23,000 lbs. g.v.w. to 53,000 lbs. g.c.w.) which cover a wide utility range as trucks, tractors, four or six-wheelers.

Like all Macks, these popular trucks are built with extra strength and sturdiness in every part...give you assurance of sustained, uninterrupted operation should trucks become difficult to replace during the uncertain period ahead.

Your nearest Mack branch or distributor will explain to you what "Built Like A Mack" means in extra long life and low-cost operation...why Mack is *today's wise buy* in trucks.

Mack TRUCKS

...outlast them all

Mack Trucks, Empire State Building, New York 1, N.Y. Factories at Allentown, Pa.; Plainfield, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

Mack Model A-40S has won outstanding recognition as a rugged, dependable dump truck. This hard-working six-wheeler is operated by Bongi Cartage Co. of Chicago, Ill.

Increase your profits by using fast-working, cost-cutting electric tools on every job, even where highline power is not available. Lightweight, sturdy, Onan engine-driven electric plants supply instantly-available power *anywhere* for lights, drills, saws, pipe-threaders, planers, spades, tampers, repair-shop tools and other motor-driven equipment. Carry 'em, wheel 'em, or truck 'em right to the spot and plug in for all the power you need. Equipped with carrying handles or dolly-mounted.

Lightweight Air-Cooled Models: A.C.—400 to 3,000 watts. D.C.—750 to 5,000 watts. Heavy-duty models to 35,000 watts.

Write for Free Folder!

Onan PRODUCTS

D. W. ONAN & SONS, INC.

6777 University Ave. S. E., Minneapolis, Minnesota

for low-cost, record-breaking performance

it's the McCARTHY SELF-PROPELLED HORIZONTAL DRILL

● The self-propelled McCarthy makes blast holes close to the floor or bottom and it makes them fast!

Actual records show that for operations in shale, sandrock and soft limestone overburdens, these tough, mobile power units easily drill up to 1500 feet per day.

Operators like the compact McCarthy design . . . ideal for working confined areas. They like the four special, individual leveling jacks that make setups easier, and the smooth, steady way the hydraulic carriage moves forward, feeding 4, 6 and 8-inch diameter auger sections into the earth to depths of 100 feet or more.

Write today for the complete story on McCarthy Drills. There's bigger money waiting for you and McCarthy knows how you can get it faster. List of users on request.

DRILLING EQUIPMENT SINCE 1901

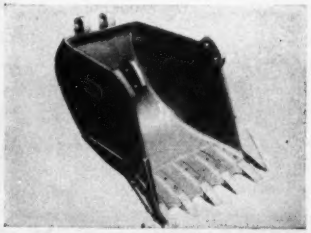
SALEM

THE SALEM TOOL CO.

765 S. Ellsworth Ave., Salem, Ohio

VARIABLE-SCALE RULE — The Gerber variable scale rule features a triangular spring that helps solve many technical and non-technical problems involving spacing, scaling, proportions, graphical-algebraic calculations, odd scales, plotting, and conversion of scales on graphs. In any position, the number of coils of the spring per in. equals the total number of coils divided by the length of the spring in inches. Thus, if the hairline is set at 4, the number of coils per inch is 100/4, or 25. A reciprocal scale permits setting the number of coils per in. directly.—**The Gerber Scientific Instrument Co., 89 Spruce St., Hartford 1, Conn.**

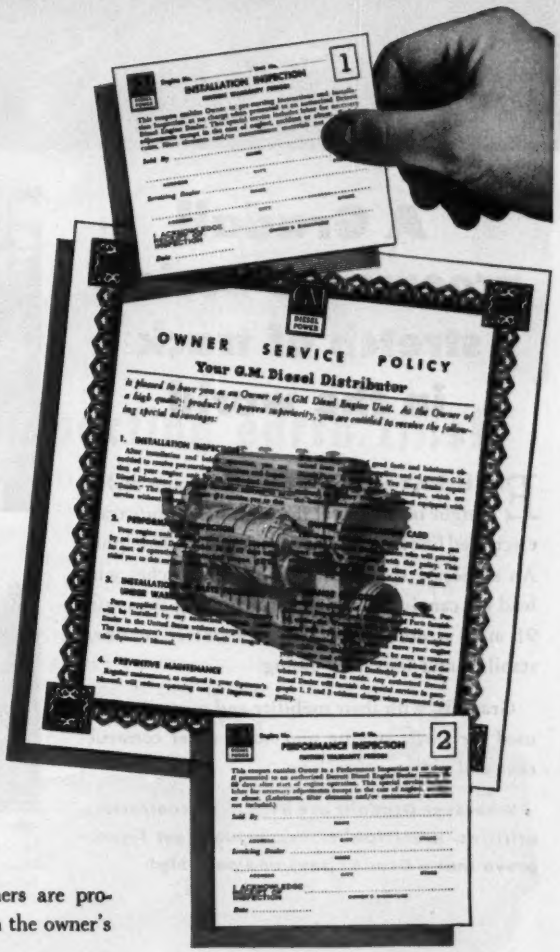
BULK-FLOW CONTROL VALVE—Flow control valve is recommended for use with bins, hoppers, and chutes in weighing and blending operations, and for free air control in heating, ventilating, and drying. It has a flexible diaphragm that acts similar to the iris diaphragm of a camera—rotating the lever increases or decreases the opening, thus regulating the flow of material. Available in five sizes to fit openings up to 12 in.—**Syntron Co., 500 Lexington, Homer City, Pa.**



FAST BACKHOE DIPPER—Addition to Esco bucket line has integrally cast tooth holders in a long projected lip to produce a clean bit and cradle and carry with ease. Six widths of side cutters, available for each dipper size, are interchangeable on ¼-yd lip to 2½-yd dippers. Heel of dipper has been practically eliminated by a long streamlined curve cutting down drag and heeling action.—**Electric Steel Foundry Co., 2141 N. W. 2nd Ave., Portland 10, Ore.**

Back of Your New GM Diesel Power

3 BIG SERVICE EXTRAS



We want every purchaser or prospective purchaser of one of our engines to know how his local GM Distributor and Dealer, with their factory-trained servicemen, stand back of the product. They in turn are backed by the knowledge that Detroit Diesel supports them strongly in their adherence to this policy.

1. *Installation Inspection:*

The GM Diesel serviceman inspects and checks the engine without cost to the owner; whenever possible this is done before the engine is put to work. He explains how to successfully operate the engine and the "preventive maintenance" necessary for best results in days to come.

2. *Performance Inspection:*

From thirty to sixty days after the engine has begun its job, another inspection is provided without charge. The GM Diesel serviceman makes any adjustments that may be required and tunes up the engine to its best performance.

3. *Owner's Service Policy:*

Besides the above inspections, GM Diesel owners are protected by the exceptional warranty mentioned in the owner's service policy.

ANSWER THE CALL CIVIL DEFENSE

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES... *Up to 275 H.P.* **DETROIT 28, MICHIGAN** MULTIPLE UNITS... *Up to 800 H.P.*

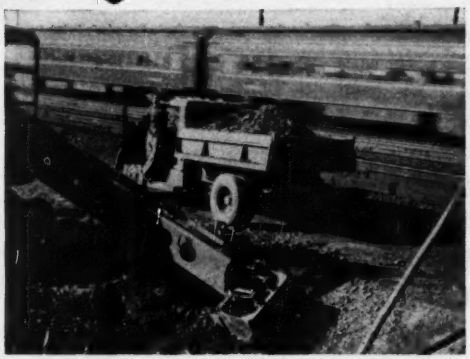
GENERAL MOTORS

GM GENERAL MOTORS DIESEL POWER

DIESEL BRAWN WITHOUT THE BULK

The Gradall stretches far to do a fast, neat clean-out job on ditches.

"Arm action" tilts the bucket laterally to dress side slopes of drainage ditch.



A Gradall grooms the busiest stretch of track in the world

EACH DAY about 400 passenger trains and 45 freight trains travel the high speed four-track electrified line between New York and Philadelphia. An elaborate system of right-of-way ditches with lead off canals has the effect of turning the entire 91 mile stretch into a fill, for better roadbed stability and improved riding.

Gradalls, with their mobility and versatility, are used for earth moving and many other construction and maintenance jobs.

Wherever Gradalls are used... by contractors, utilities, municipalities... actual cost figures prove that a Gradall pays and pays big!

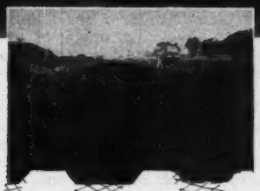
In this restricted location working under low-hanging power lines the Gradall widens bottom and does a precision job following contours of this ditch.

Gradall Distributors in over 60 principal cities in the United States and Canada

Gradall
DIVISION OF
WARNER & SWASEY
Cleveland

GRADALL — THE MULTI-PURPOSE CONSTRUCTION MACHINE

SOUTHWEST Compaction Roller



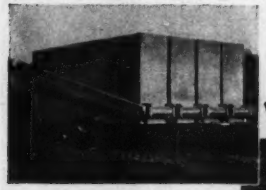
Note how every print of each tire tread is uniform in depth and shape.

The weight-box units are hinged at the rear and oscillate independently.

For compacting earth fills!

UNEVEN GROUND CONTOURS cannot reduce the efficiency of the new Southwest Compaction Roller. As it travels over the variable surface of the earth fill each weight-box unit with its own wheel and tire oscillates independently up and down. Compaction is positively uniform because the weight on each tire remains constant—there is no bridging and no sudden shifting of load from tire to tire.

The sectionalized tubular yoke permits the use of any combination from three to six weight-box units. The unit is easy to dismantle for shipment. Write for literature.



CONSTRUCTION MACHINERY DIVISION

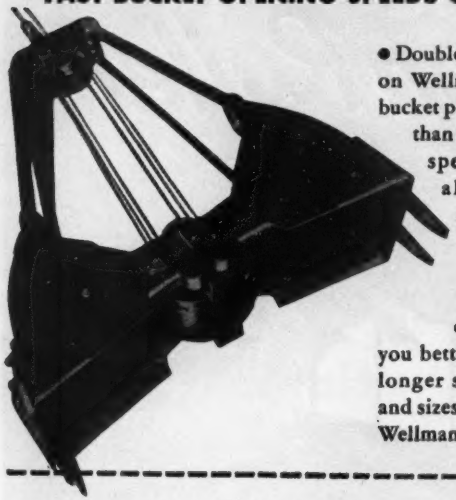
Southwest Welding & Manufacturing Co.

Alhambra, California

HAULING SCOOPS BULLDOZERS LOADERS BOTTOM DUMP WAGONS RIPPERS TAMPERS SCRAPERS TREE DOZERS

WELLMAN *Williams Type*

FAST BUCKET OPENING SPEEDS OPERATIONS



● Double-hinge construction on Wellman's multiple-rope bucket permits faster opening than a single hinge. This speeds up operations, also gives a bigger spread in the open bucket for the same headroom.

Wellman's welded-design buckets offer you better performance and longer service. In all types and sizes you'll do better with Wellman!

Want Facts?
Write for free descriptive bulletins.
CLAMSHELL • DRAGLINE • CUSTOM-BUILT BUCKETS • STONE AND WOOD GRABS

THE WELLMAN ENGINEERING COMPANY
7000 Central Avenue
Cleveland 4, Ohio

Got a *wet job?*

Our WELLPOINT SYSTEMS have dried thousands of them quicker,-at lower cost! ...Our engineers will be glad to estimate your wet job!

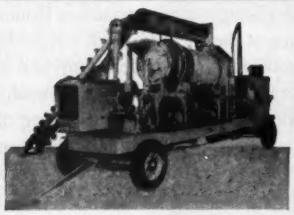
Call COLLECT

GRIFFIN
WELLPOINT CORPORATION
881 EAST 141st ST., NEW YORK 54, N. Y.

Please send Engineer to estimate our dewatering requirements.

Name.....
Firm.....
Address.....

*Phone nearest office: NEW YORK, MElrose 5-7704; HAMMOND, IND., Sheffield 1562; JACKSONVILLE, FLA., Jacksonville 5-9823



ASPHALT PLANTS
Complete units for maintenance and moderate contract paving. Sizes—4, 8, 15, 30 tons per hour.

Other Products

CONCRETE VIBRATORS
Gasoline Engine and Electric Motor Driven Models

HEATING KETTLES
for Asphalt and Tar

AGGREGATE DRYERS
for Stone and Sand

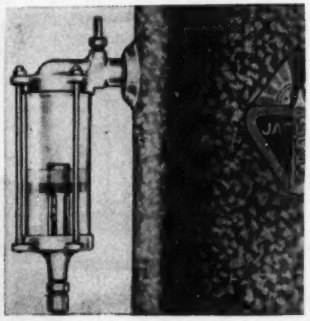
FRONT END LOADERS
for Industrial Tractors

WRITE FOR CIRCULARS

White Mfg. Co.
ELKHART INDIANA

PLANE CUTTING GUIDE—Attachment for planes simplifies the cutting of square edges. The Square-Ezy consists of a clamp with a free-turning cylindrical sleeve that extends below the base of the plane. This sleeve acts as a fence and keeps the plane at a right angle to the side of the board being planed. Hardwood knob on the side provides a firm grip and permits putting sideward and downward pressure on the plane. Uniform bevel is obtained by adjusting angle of the plane's blade.—**Bratton Co., Edwardsville, Kan.**

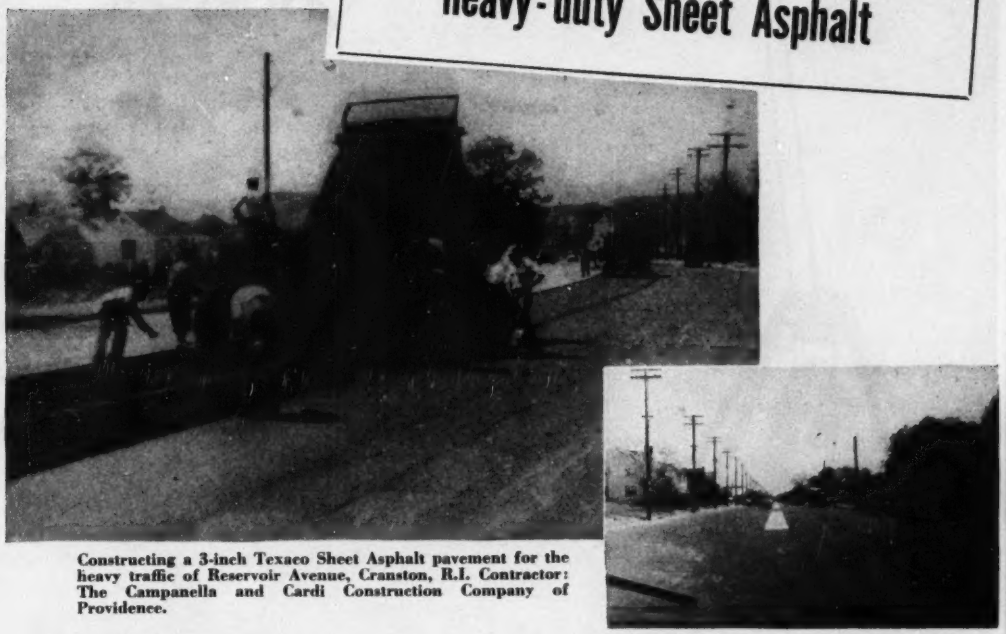
HARD-SURFACING ELECTRODE—Ranite B-X hard-surfacing electrode features a 25% faster deposition rate. This increased welding speed is said to decrease heat induction into the parent metal by one-third, minimizing heat strains and preserving original characteristics of the metal.—**Rankin Mfg. Co., 3072 W. Pico Blvd., Los Angeles 6, Calif.**



TANK-PRESSURE RELIEVER—Supercharger is said to eliminate tank water-logging caused by tanks being filled too completely. It insures that there will be a sufficient cushion of air above the water to provide pressure. It is said to maintain proper balance between air and water in the tank automatically, preventing frequent starts and stops of the pump. — **Jacuzzi Bros., Inc., Richmond, Calif.**

Where two important State Highways become one...

...the pavement Rhode Island laid was heavy-duty Sheet Asphalt



Constructing a 3-inch Texaco Sheet Asphalt pavement for the heavy traffic of Reservoir Avenue, Cranston, R.I. Contractor: The Campanella and Cardi Construction Company of Providence.

Two of Rhode Island's principal north-south highways are its Routes 2 and 3. South of the city of Cranston, these highways come together, sending their combined traffic over this municipality's Reservoir Avenue.

This year, the State of Rhode Island is widening a substantial portion of Reservoir Avenue to six lanes, then paving it with 114,000 square yards of Texaco Sheet Asphalt. Laid in two courses, in this case a 1½-inch binder course and a 1½-inch wearing surface, this dense, resilient type of pavement successfully absorbs punishing traffic impact year after year, with a low maintenance cost. This has been demonstrated by the performance of many million square yards of Sheet Asphalt under the heaviest kind of traffic.

The 60-70 penetration asphalt used on Reservoir Avenue, like all other Texaco asphalts, is a product of carefully selected crudes. Into its refining goes the know-how gained through supplying asphalt to America's road builders for 45 years.

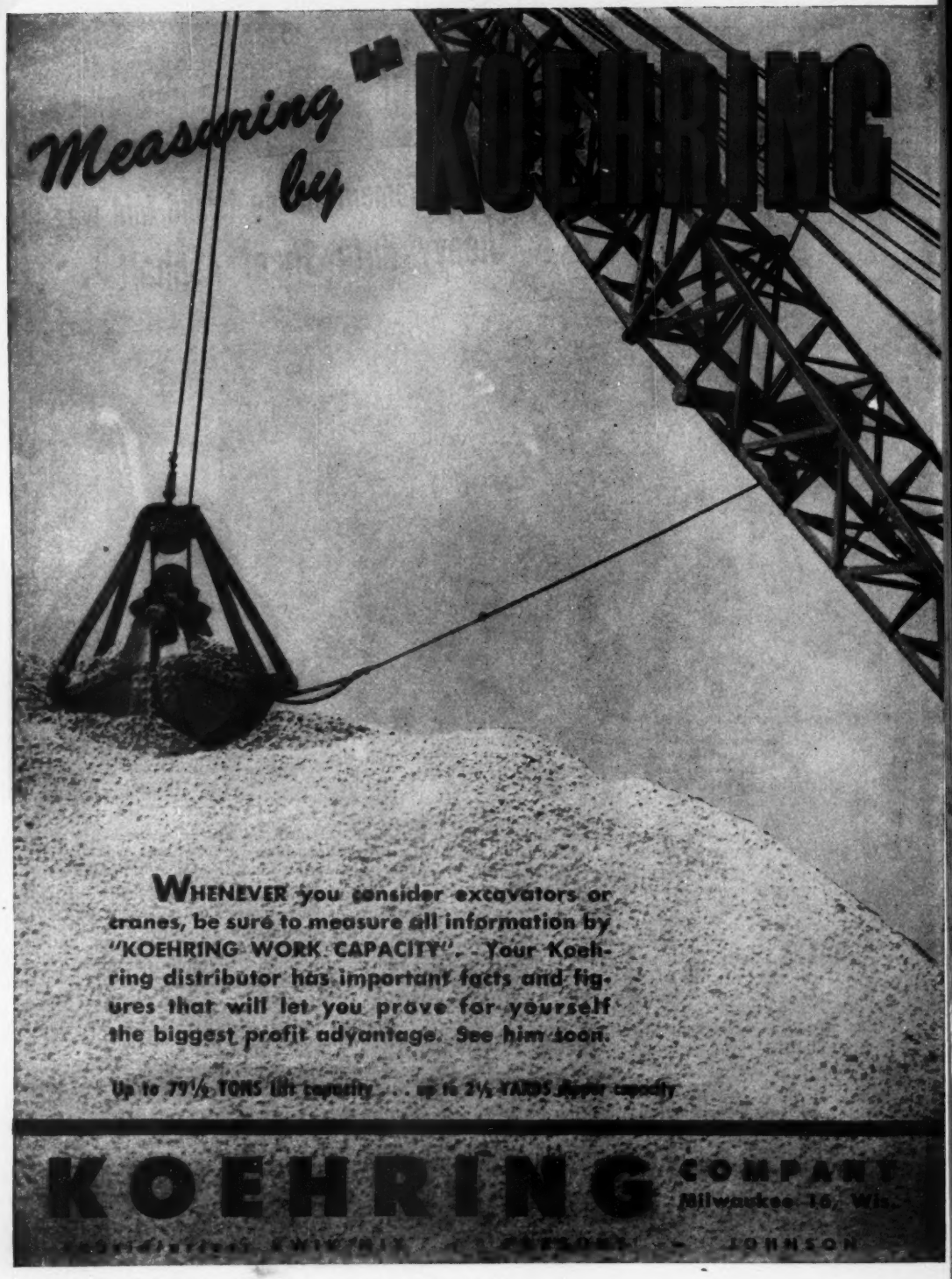
A helpful booklet about Sheet Asphalt and other heavy-duty asphalt pavements of the plant-mix type may be obtained without charge or obligation by writing our nearest office.

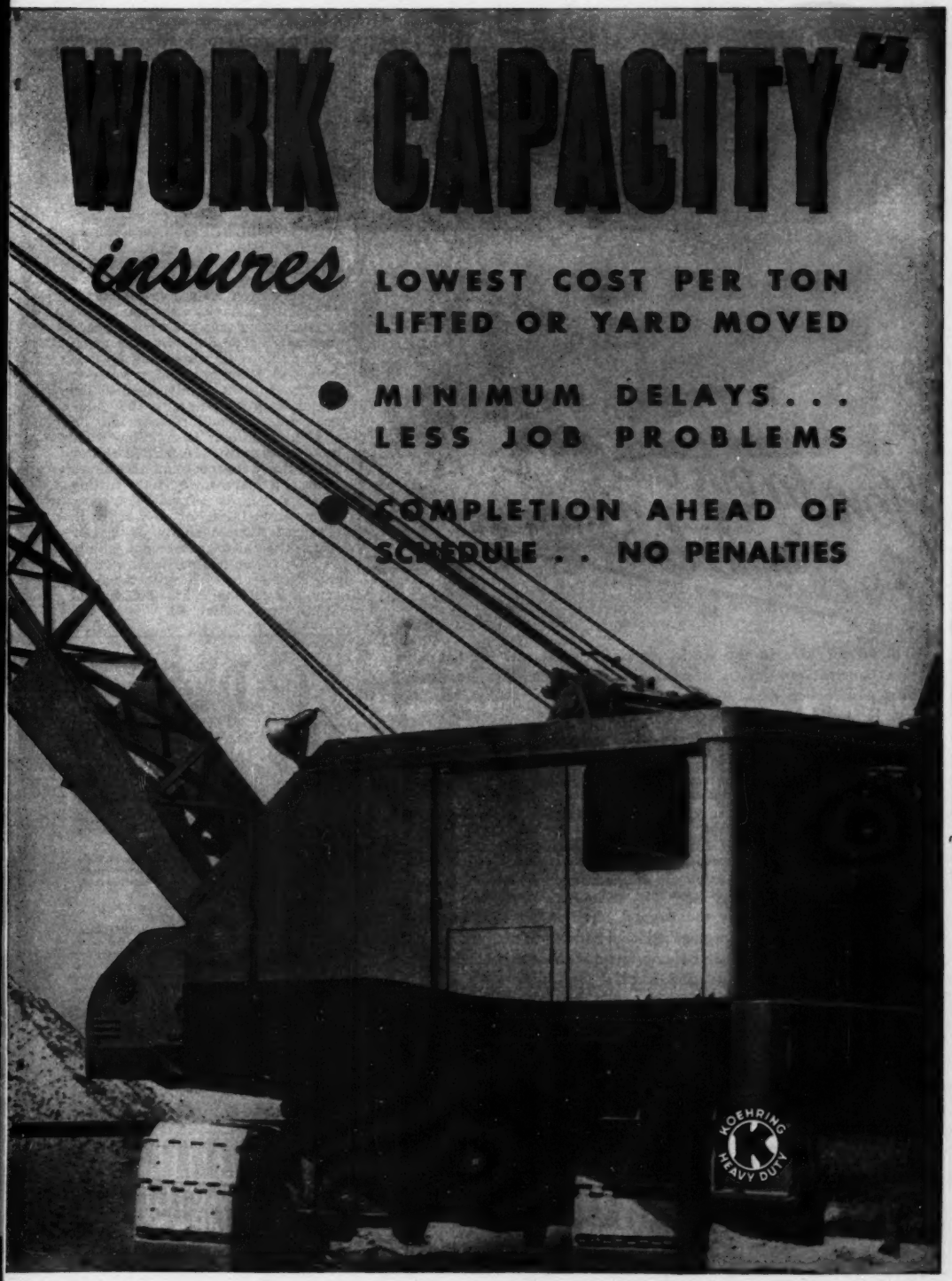
THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17

Boston 16 Chicago 4 Denver 1 Houston 1 Jacksonville 2 Philadelphia 2 Richmond 19

TEXACO

TEXACO ASPHALT


Measuring by KOEHRING
WHENEVER you consider excavators or cranes, be sure to measure all information by "KOEHRING WORK CAPACITY". Your Koehring distributor has important facts and figures that will let you prove for yourself the biggest profit advantage. See him soon.
Up to 79½ TONS lift capacity . . . up to 2½ YARDS dipper capacity
KOEHRING COMPANY
Milwaukee 16, Wis.
JOHNSON


WORK CAPACITY"
insures
LOWEST COST PER TON LIFTED OR YARD MOVED
MINIMUM DELAYS . . . LESS JOB PROBLEMS
COMPLETION AHEAD OF SCHEDULE . . NO PENALTIES
KOEHRING
HEAVY DUTY

How to put a Ceiling on Accident Severity—

With all the care in the world, you can't avoid all the hazards on a construction job. But where falling objects are involved, you CAN reduce these accidents to incidents . . . with M.S.A. Type K Skullgards.

You'll find confirming evidence in Casualty Department reports like these—digested from actual files:

. . . Superintendent of Erection struck on head by falling steel plate. Safety hat crushed and demolished. Man was uninjured.

. . . fork wrench fell 90 feet, striking safety hat. Man knocked to squatting position . . . otherwise uninjured.

. . . a two-sheave 8-in. wooden block fell 45 feet . . . struck man on safety hat, rebounded to shoulder. Hat dented, but cushioned blow so man was uninjured.

. . . Superintendent of Construction (on a large bridge job) feels that use of safety hats has saved the lives of seven men during past 12 months.

M.S.A. Skullgards have the rugged strength that defies construction hazards . . . plus engineered head bands that can be adjusted to a perfect fit, and have the comfort-qualities that encourage full-time hat use. Ask for Bulletin DK-15.

MINE SAFETY APPLIANCES CO.
BRADDOCK, THOMAS AND MEADE STREETS
PITTSBURGH 8, PA.
At Your Service:
54 BRANCH OFFICES IN THE UNITED STATES AND CANADA

Call the MSA man on your every safety problem . . . his job is to help you.

MSA
SAFETY EQUIPMENT HEADQUARTERS

PLASTIC COVER PLATE—Giving up to 1000 hr of service, a hard, clear, almost colorless welding helmet window cover is made of thermosetting plastic, said to be superior to regular thermoplastics for this particular job. Cannot crack or shrink and will not discolor under normal welding conditions. More resistant to pitting than glass.—**American Optical Co., Southbridge, Mass.**

NEW MODEL SUPER-SAW needs no starting hole—The entire unit of this new model is sealed against grease leakage. In addition, a new grip has been added, as well as a redesigned shank vise which the manufacturer says prevents slippage or chatter. The Super-Saw needs no starting hole, thus speeding up keyhole and other types of saw work. Merely hold it firmly against the material to be cut with the guide as a fulcrum, and rock it into an upright position. Then follow your guide lines as usual. A built-in blower keeps the motor cool and also blows chips and dust away from the cutting line. Power is provided by any heavy-duty 1/4-in. or 5/16-in. drill, standard flexible shafts or by air drills. Over-all measurement is only 10 3/4 in. For full particulars on its use in shops as well as in the field, send for catalog P 53.—**R.C.S. Tool Sales Corp., Joliet, Ill.**

BLADES For Snow and Ice Removal

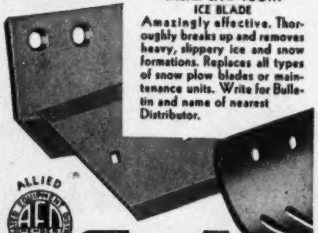
FOR ALL MAKES AND MODELS OF SNOW PLOWS

Made of specially developed steel to withstand severe service conditions.

Various widths, lengths, thicknesses—flat or curved—standard or special—punched ready to fit your machine.

SHUNK SAW-TOOTH ICE BLADE

Amazingly effective. Thoroughly breaks up and removes heavy, slippery ice and snow formations. Replaces all types of snow plow blades or maintenance units. Write for Bulletin and name of nearest Distributor.



ALLIED

Shunk
MANUFACTURING COMPANY
ESTABLISHED 1854
BUCYRUS, OHIO.

ON PAVEMENT

Model HF
¾ yd. PAYLOADER

IN PITS

Model HM
4-wheel-drive
1½ yd. PAYLOADER

PAYLOADERS

PAY OFF ANY PLACE

CATALOG and complete facts about any size PAYLOADER are available without obligation: the big 4-wheel drive 1½ yd. Model HM; the 1¼ yd. HY; the ¾ yd. HF; the ½ yd. HE; the 12 cu. ft HA.

PAYLOADERS work where you want them to work — on pavement, in sand, gravel or stone pits, in yards, or on any earth-moving job off the road, because they have tremendous traction and flotation on big pneumatic tires, plus proper weight distribution.

ALL PAYLOADERS have full-reversing transmissions with several speeds both forward *and* reverse. ALL PAYLOADERS have operator location high and forward for full visibility . . . have complete fingertip hydraulic control of lifting, lowering, bucket-dump and bucket-close.

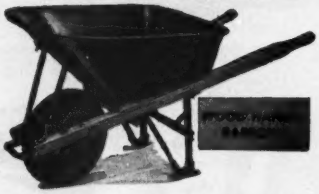
In PAYLOADERS you are assured of the best in tractor-shovels — complete unit-design tractors *and* shovels built by the world's largest tractor-shovel manufacturer, with a world-wide service organization to keep your jobs going. THE FRANK G. HOUGH CO., 706 Sunnyside Avenue, Libertyville, Illinois.

PAYLOADER®
THE FRANK G. HOUGH CO. . . . SINCE 1920

Am I Glad We Have STERLINGS!

At a time when wheelbarrows are scarce, it certainly feels good to have a supply of sturdy Sterling Barrows on hand. Sterlings are so ruggedly constructed, they seem to last forever. In the present emergency, many Sterlings are working overtime, taking hard punishment and coming back for more . . . again proving . . . IT PAYS TO BUY THE BEST.

(Above) Model D3½S Maximum Capacity 3½ cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Steel channel legs. V-shaped front braces and brace support.



(Right) Model C5W Maximum Capacity 5 cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Heavy-duty malleable wheel guard.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

Crush Your Own Rock

Reliance EQUIPS your JOBS

RELIANCE PRODUCTS

Rock Crushers, Bucket Elevators, Revolving Screens, Storage Bins, Pulverizers, Chip Spreaders, Heating Kettles, Bin Gates, Feeders, Belt Conveyors, Grizzlies, Air Separators, Sand & Gravel Spreaders, Wash Boxes.

Rather than face the delay and expense of rail or highway shipments of crushed stone, gravel and sand, *install your own plant* and save both time and money.

We'll gladly refer you to contractors who are making money and rushing their work with RELIANCE Equipment.

Write for the latest RELIANCE Bulletins.

Quality products still available at moderate cost.

UNIVERSAL ROAD MACHINERY CO.

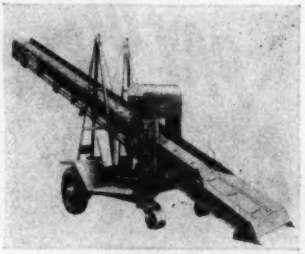
Kingston, N. Y., U. S. A.

DISTRIBUTORS IN ALL PRINCIPAL CITIES OF U. S. A.

DANGER-SIGN STANDARD—Angle-iron frame of sign standard opens into a wide base to prevent tipping or blowing over. It weighs 13 lb, and when folded, locks the warning sign in place. Size is 27x18 in. Reflectorized signs are available. Mounts are included for installing two red flags. **—Eastern Metal of Elmira, Inc., Elmira Heights 2, N. Y.**

FORGED-STEEL GATE VALVE—Designed for high-pressure service, the R-P&C gate valve features bolted bonnet, tongue-and-groove joint with soft-iron gasket, and hard wedge facing that minimizes seizing, galling, and abrasive wear. Stainless steel gland bolts and nuts prevent freezing or corrosion. The two-piece gland and follower applies uniform pressure on packing. Available in ¼-, ⅜-, ½-, ¾-, 1-, 1¼-, 1½-, and 2-in. sizes. **—R-P&C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.**

IMPROVED BRONZE BEARINGS—Line of bearings and bushings is available in sizes up to 24 in. dia., in plain, flanged, split, or combination types. Finishes range from accurate machine finish to a semi-finish for rough work. Cast from rigidly controlled bronze bearing metals, they incorporate special lubrication designs to meet individual requirements.**—Bronze Bearings, Inc., 798 North Ave., E., Cranford, N. J.**



TROUGHED-BELT CONVEYOR — Model 638 power-moved troughed-belt conveyor is described as a heavy-duty materials handler. It features simplified drive and controls, improved maneuverability of individual wheel steering, hydraulically operated boom hoist, and self-equalizing casters for balance in yard operations.**—Fairfield Engineering Co., Marion, Ohio.**

Every contractor should have these three money savers!

CLECO PAVING BREAKERS

The Reed-Cleco Valve, found only in Cleco Paving Breakers, gives full control of both power and return strokes.

Cleco Paving Breakers hit harder and faster and have less recoil. They produce more work per man hour and cost less to maintain than any other demolition tools in their classes.

Write for Bulletin RC-949

CLECO SUMP PUMP

340 gpm against a 10' head.
124 gpm against a 70' head.

High capacity, light weight, low air consumption make the Cleco 183-A Sump Pump the first choice wherever a high-capacity portable pump is needed.

Write for Bulletin SP-849

CLECO BACKFILL TAMPER

- Full power stroke of the piston gives deeper penetration and faster compaction.
- Rugged, heavy-duty construction for long life and low maintenance.
- Light weight and excellent balance for easy handling.

Write for Bulletin 76-B

CLECO AIR TOOLS

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of the REED ROLLER BIT COMPANY, 5125 Clinton Drive, Houston 20, Texas, U.S.A.

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for hoe and crane operators

Close quarters, low hanging trees, pipes criss-crossing trench path . . . that made trenching a ticklish job for the hoe operator. And the crane operator's job was just as critical. Working in cramped space where boom couldn't be raised above cab top required exceptional control to place gas main sections under the small cross pipes.

But the job was done . . . and done *profitably and easily* with a MICHIGAN crawler and a MICHIGAN truck crane by William W. Adams, Inc., general contractors of Tenafly, New Jersey. That's why George Adams says . . .

"I like MICHIGAN . . . I wouldn't have bought three of them otherwise. They are very easy on maintenance and easy on the operators."

Comments like these are typical from profit-wise contractors everywhere. Next time you need an excavator crane . . . investigate MICHIGAN and you'll agree it's your *best buy!* Write, wire or phone for full details.

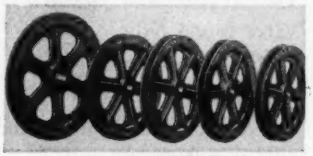
MICHIGAN POWER SHOVEL COMPANY

495 Second Street, Benton Harbor, Michigan, U. S. A.

RUBBER FRAME GOGGLE—Used separately or fastened temporarily or permanently to respirators, 701 goggle provides gas-tight seal. Recommended specifically for gas, fume and smoke hazards, it can be perfectly fitted and adjusted to prevent infiltration of air.—**American Optical Co., Southbridge, Mass.**

GRAPHITE GROUND ANODE—The 3x60-in. National graphite ground anode features an increased amount of graphite per unit of exposed surface. These anodes are recommended for cathodic protection of pipe lines and other underground and underwater metal structures. They are furnished complete with 36-in.-long insulated No. 8 weatherproof cable.—**National Carbon Co., Div. Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.**

SCREW-TAPPING ATTACHMENT—Leadscrew tapping attachment consists of a support arm, support-arm clamp, support-arm screw, support-arm washers, leadscrews, split nut, split-nut mounting screws, split-nut washers, lock assembly, and Jacobs Rubberflex collet and nut. Split nut and leadscrew are interchangeable for different threads. The assembly is provided as an attachment to any standard drillpress. Taps from 0 to ¼ in. may be used without changing the collet.—**Automatic Methods, Inc., Room 81, 42 Walnut St., Newark 1, N. J.**



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PROTECT YOUR WIRE ROPE with genuine American Hoist replacement sheaves. Same top quality used on all American Hoist cranes and other big name equipment. Complete stocks, all types and sizes. Prompt shipment from either St. Paul or So. Kearny plant.

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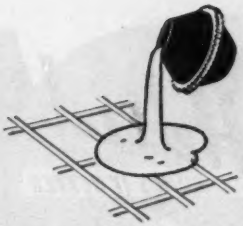
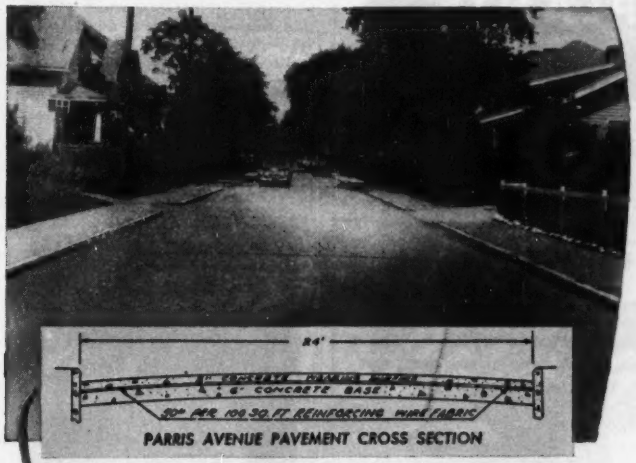
Make First Pavements *Last* with American Welded Wire Fabric





PARRIS AVENUE PAVEMENT CROSS SECTION

THESE PAVEMENTS were laid on 43rd Street in the month of June, 1924, and on Parris Avenue, both in Indianapolis, Indiana, in the month of October, 1923. The unretouched photos show that both are still in first class condition in the year 1950. The diagrams show details of construction, which, except for variations in width and thickness, are the same as those used in the latest interurban highways and city streets.

43rd STREET PAVEMENT CROSS SECTION

THE two streets illustrated here were paved with concrete, reinforced with American Welded Wire Fabric, in 1923 and 1924 respectively. They are still, as you can see, in first class condition. And on hundreds of thousands of miles of concrete highways and streets all over the country, American Welded Wire Fabric reinforcement also assures long years of trouble-free service.

U·S·S American Welded Wire Fabric has definite structural superiority to other forms of concrete reinforcement. It distributes the strength of steel evenly throughout the concrete, fortifies the slabs against all-directional stresses, provides positive control of any cracking that may occur and forms a secure bond with the concrete.

When next you consider paving, be sure you are fully informed upon the superior riding qualities, safety and durability of concrete, reinforced with American Welded Wire Fabric. And remember, on a cost per year basis it is the most *economical* pavement for streets and highways.

Many standard designs and sizes of American Welded Wire Fabric are now readily available from jobbers' and dealers' stocks, supplemented by prompt mill shipments to identified projects. Our technical staff will be glad to consult with you regarding your individual requirements. Literature which contains valuable information is yours for the asking. Just drop a line to our nearest sales office.

You use less concrete, less steel (of a non-critical type) for slabs of comparable strength with this modern fabric reinforcement. This conservation of materials, plus savings in construction time and cost, makes the use of American Welded Wire Fabric more important than ever now—when every hour, every dollar saved is an important contribution to the all-out mobilization effort.

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reinforcement

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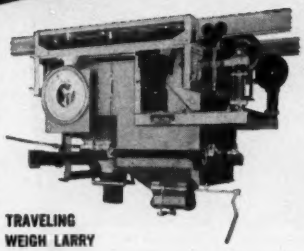
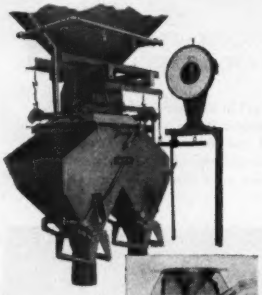
Heltzel BUILDS IT BETTER

BATCHING PLANTS

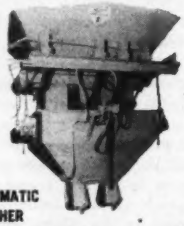
● Heltzel batchers exemplify the advanced engineering that is incorporated in all the details of Heltzel batching plants. Heltzel manufactures ten types of batchers specifically designed for faster, more accurate batching. Portable aggregate or cement plants, combination cement-aggregate plants, or circulating bulk cement plants — whichever you require, Heltzel affords you more value for each operating dollar.



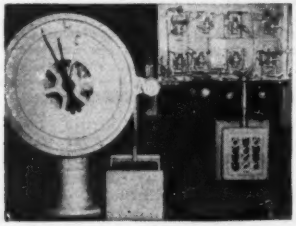
TRAVELING WEIGH LARRY

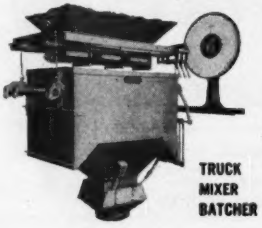


DUAL CEMENT BATCHER WITH TUBULAR CEMENT VALVE



AUTOMATIC BATCHER WITH CONTROLS





TRUCK MIXER BATCHER

HELTZEL

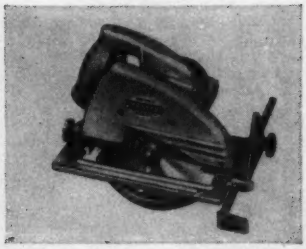
STEEL FORM & IRON CO.

WARREN, OHIO

PROTECTING CONCRETE — "Adhesion is the greatest factor in the performance of any floor coating" according to the maker of a new two-coat method of protecting and preserving concrete surfaces. "What is oftentimes mistaken for poor wearing quality is actually poor adhesion," he continues. "Many coatings which work fine on metal or wood will disintegrate and break down when applied to concrete." This two-coat method entails applying clear "Oncrete" as a first coat and colored "Oncrete" for the second. The first is said to provide an adhesive and moisture barrier for the latter, giving high adhesion performance on concrete, brick and other porous masonry materials.—**Lowebco, Inc. 1525 E. 53rd St., Chicago 15, Ill.**

PROTECTIVE "EAR-VALV" guards ear drums—Here's a new gadget whose efficiency and usefulness is highly recommended and endorsed by drillers, riveters, industrial workers and shooting instructors. The Lee Sonic Ear-Valv eliminates the harmful effect of sudden blast-type noises on ear drums, at the same time leaving the ear canal open to permit passage of normal voice level sounds. Following an explosion there is often a vacuum which is more harmful to the ear drum than the blast itself and the valve also eliminates forces from these vacuums. Unlike a hearing aid it has no wires, batteries or other parts. It's definitely not a plug, but a sonic filter. Because the canal is left open to air circulation the valve is not uncomfortable to wear, thus encouraging continual usage. One owner claims that since its principle is similar to that of a human ear, one might say he has four ear drums instead of two.—**Sigma Engineering Co., 1491 No. Vine St., Dept. M, Los Angeles 28, Calif.**

MATERIALS-HANDLING PUMP — Air-operated double-acting pumps are designed for use with spray or flow guns including those used for fine finishing work. They handle all materials from thinners, enamels, lacquers, and paints to adhesives, sound deadeners, heavy roofing materials, and protective coatings of all kinds. The pumps operate directly from original shipping containers. Materials pressures as low as 3 lb can be maintained.—**Binks Mfg. Co., 3122 Carroll Ave., Chicago 12, Ill.**



PORTABLE 6¼-IN. SAW—Circular saw has a 6¼-in. blade that cuts through 2-in. stock on a 45-deg angle. Features of the Ramsaw include a built-in bevel and depth adjustment, ¾-hp motor, plastic window in the guard that allows the user to see the line of cut, and an adjustable rip fence that extends to 8 in. for precision ripping.—**Master-Taper Co., 4531 N. Beacon St., Chicago 40, Ill.**

AIR STARTING MOTORS — Designed for cranking diesel and gasoline engines with piston displacements up to 3500 cu in., these starting motors can be powered by compressed air or natural gas under sufficient pressure. Unaffected by climatic conditions, and smaller than many electric starters, they

(Continued on page 163)

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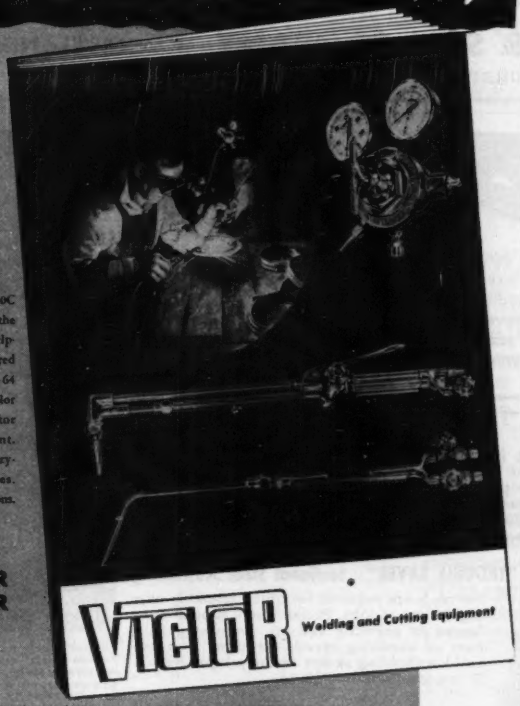
New VICTOR Catalog



Your Victor Catalog 20C is now available. It is the most attractive and helpful we have ever offered —four-color cover—64 pages—many full color illustrations of Victor units and equipment. Fully describes everything Victor makes. Complete specifications.

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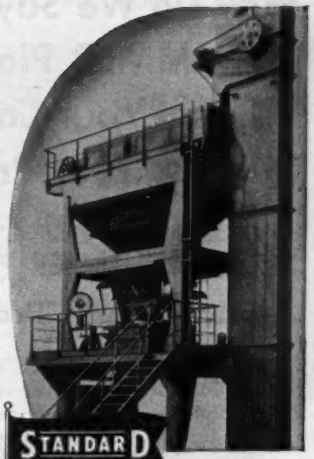

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MONEY-SAVING PAVING PLANTS

The most rugged plants in America and the cheapest to own and operate. Less maintenance. Simplest design. Seven sizes. Unit built. Prompt delivery.

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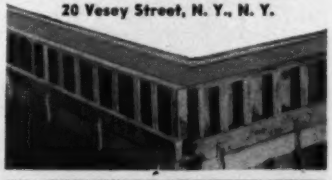
Atlas

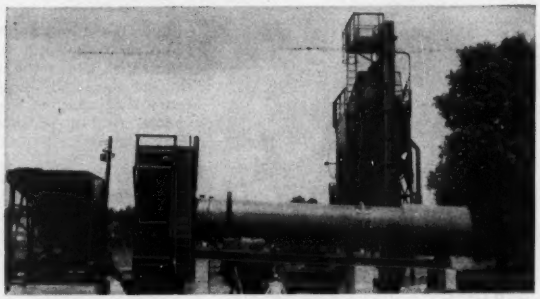
STEEL SYSTEM of Concrete Form Speed Construction

SAVINGS of 1/3 to 1/2 and over 500 uses are reported by contractors everywhere. All steel SPEED forms can be set up, stripped, cleaned, moved and reused in far less time than wood. Interchangeable on job after job, year after year—walls, slabs, circular tanks, manholes, tunnels, etc. For complete facts write Dept. MC.

IRVINGTON FORM & TANK CORP.
20 Vesey Street, N. Y., N. Y.



Why Do We Say— "A CUMMER Plant Will Cut Your Costs... Increase Your Profit?"



Because CUMMER Portable Asphalt Plants Produce More—*Faster*—at *Lower Cost!*

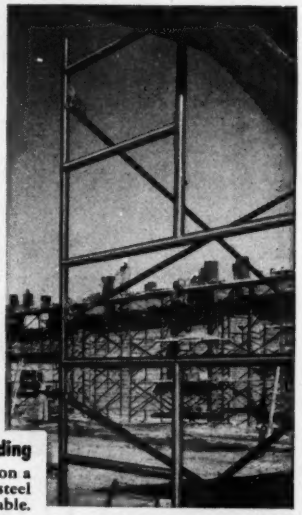
The improved, big-capacity *Cummer Dryer* is fast-producing, exceptionally efficient... Cummer Portable Plants are easily transportable — can be completely assembled in as little as 12 hours... No chain or belt drives — all moving parts are individually motor driven... Cummer Plants are complete power units with vibrating screen, mixer, dust elevator, enclosed cold elevator, cold storage bin and feeder... Fired with oil or gas burners... Can be powered with Diesel engines ... Available in sizes from 60 to 100 tons per hour... Axles and pneumatics may be furnished ... Cummer Portable Asphalt Plants lead the field for sensible, modern design, rugged construction, low operating costs and continuous, profitable production. With a Cummer you *maximize* output...*minimize* overhead! Write for a Cummer Catalog today.

THE F. D. CUMMER & SON COMPANY • CLEVELAND 14, OHIO

BUILDERS OF FINE ASPHALT PLANTS

Build Faster— with these Built-Up Scaffolds

Both can be erected and dismantled faster. Your saving in man hours means that jobs are finished sooner...and your profits are greater. Whatever your needs, "Patent" offers you the *right* scaffolding to do your work faster — *more economically... and with complete safety.*



Illustrating new mason-type frame which provides most convenient working and material storage levels. One of many time-saving units available with "Trouble Saver" Scaffolding. Approved by Underwriters' Laboratories, Inc.

"TUBE LOX"® Scaffolding
(Steel or aluminum)

No job is too difficult for versatile "Tube Lox". Extreme height, curved surfaces, uneven ground are no problems. Only four, quickly-assembled basic parts are used. Saves hours... saves dollars! Write for Bulletin 10-PTS.

"TROUBLE SAVER" Sectional Steel Scaffolding

No tools are required for quick assembly on a big variety of jobs. Prefabricated tubular steel frames fit perfectly and are interchangeable. Ease of handling speeds erection. You can build scaffolding as fast as the job progresses. Write for Bulletin PSS-24.

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for Greater Safety...Efficiency...Economy

THE PATENT SCAFFOLDING CO., Inc.

Scaffolds for Any Purpose — Any Time — Any Place—

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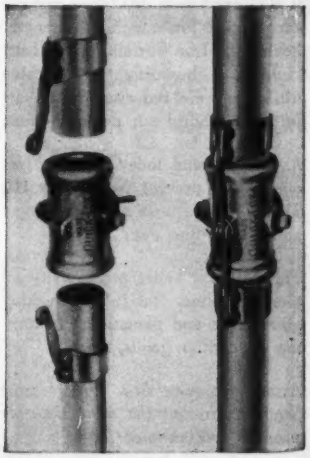
(Continued from page 161)

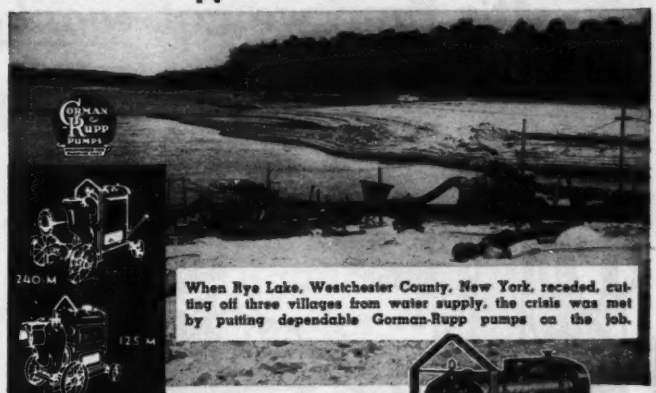
eliminate need for generators, banks of storage batteries and cut battery replacement and repair costs. Easily installed, housings can be rotated in the gear case, or gear case rotated on the motor bell housing to clear engine projections. Size 9BM develops up to 16 hp, requires 7 cu ft of air per start, size 20 BM up to 41 hp on 16 cu ft. Smaller model weighs 40 lb, larger, 103 lb.—**Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.**

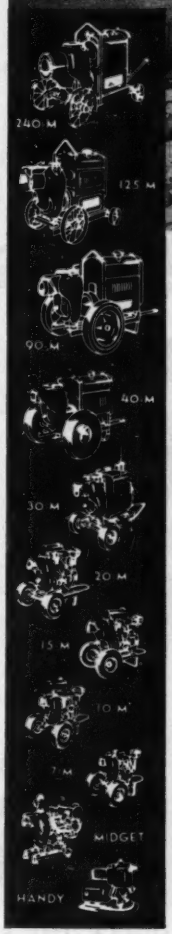


PIPE COUPLING THAT NEEDS NO TOOLS—Forget about your wrenches, tongs and heavy connecting equipment and instead use the new quick-locking coupler equipment called Quick-Lok. According to its manufacturer, tests have proved that one man can lay as much as 1000 ft of pipe an hr with the use of these couplings. Because of its fast setup ability, it should find a range of uses in the construction industry for carrying air or water under pressure. Outlets are provided on each one for connecting laterals, bypasses, or access lines. Couplers, made of aluminum alloy, are tested to 300 psi. Two styles of gaskets are available, one of which is self-draining, and they're protected by the coupler lip against tearing or damage.—**R. M. Wade & Company, Portland, Ore.**

THIN ELECTRIC TAPE—Said to have a dialectric strength of 8,000 v and to be waterproof, resistant to acids, oils and alkalis, this new electrical tape, made with Koroseal materials, is extra thin and takes up much less room in junction boxes. Non-transferring, it will not lose its stickiness after several applications and removals from a dry surface. Packaged in a roll 60 ft long, it is ¾ in. wide and .007 in. thick.—**B. F. Goodrich Co., Akron, Ohio.**

Gorman-Rupp's Handle Low Water Crisis at Rye Lake


When Rye Lake, Westchester County, New York, receded, cutting off three villages from water supply, the crisis was met by putting dependable Gorman-Rupp pumps on the job.



240-M 10 inch

THE WORLD'S MOST COMPLETE LINE . . . OF SELF-PRIMING CENTRIFUGAL PUMPS

Whatever the job requires: a tiny twenty pound "Handy" pump, a lightweight "Midget" pumping 5500 GPH, or a pump handling up to 240,000 GPH, you will find the most efficient pump is the Gorman-Rupp.

QUICKEST PRIMING: The 40 M, for example, primes at 15 foot Suction Lift in 40 seconds.

HIGHEST PRIMING: High suction lifts are easy for Gorman-Rupp Pumps.

FASTEST PUMPING: More water per gallon of fuel than any other comparable pump.

DEPENDABLE: The most simple pump built — will not clog. Trouble-free, requiring a minimum of maintenance.

GUARANTEED IN PLAIN LANGUAGE by Manufacturer and Distributor. Ask for copy of our guarantee.

Write for new Contractors' Bulletin 8-CP-11.

THE GORMAN-RUPP COMPANY
MANSFIELD, OHIO

It's time we got *working* mad!

As we listen to the latest insults from Moscow, we're likely to get fighting mad.

Instead, we'd better use our heads and get *working* mad.

It is clear by now that Stalin and his gang respect just one thing—strength. Behind the Iron Curtain they've been building a huge fighting machine while we were reducing ours. Now we must rebuild our defenses—*fast.*

As things stand today, there is just *one* way to prevent World War III. That is to re-arm—to become strong—and to stay that way!

This calls for better productivity all along the line. Not just in making guns, tanks and planes, but in turning out civilian goods, too.

Arms must come first. But we must produce arms *at the same time* we produce civilian goods.

We can do this double job if we all work together to turn out more for every hour we work—if we use our ingenuity to step up productivity.

All of us must now make sacrifices for the common good. But we're working for the biggest reward of all —*peace with freedom!*

THE BETTER WE PRODUCE THE STRONGER WE GROW

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WHITNEY CHAIN DRIVES

Help the Williams Hole Digger Put Down a 9 Foot, 18 Inch Diameter Hole In 2 Minutes Flat

This ingenious machine, manufactured by the Hugh B. Williams Manufacturing Company, can dig holes up to 3 feet in diameter and 9 to 25 feet deep by variations in the unit. Under normal conditions the digger can put down a 9 foot, 18 inch diameter hole in two minutes. That's speed... and it calls for a ruggedly built chain drive that will travel and stand up too.

For positive power transmission and high performance under all operating conditions, Williams uses Whitney Chains throughout for driving the various units. Despite rocks and other obstructions often encountered, Whitney Roller Chains take tough usage in stride — keep working, day in, day out.

Here's what this company says about Whitney Chain performance:

"We have been consistently using Whitney Chain in our machines because we have always found it to be strong, uniform and of excellent construction throughout. Wearing qualities are above average and in our machines, which are used in all weather conditions, this is very important. In short, we feel that your chain has given excellent performance in every respect". — T. E. Green, Sec. Treas.

You, too, can keep your equipment operating longer, simplify your designs and cut costs by standardizing on Whitney Chain Drives.

Consult your local Whitney Field Office or Distributor, or write direct for complete information and catalog.

WHITNEY CHAIN COMPANY

122 Hamilton Street, Hartford 2, Connecticut

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Just Published — 3rd Edition

1. Covers every phase of mathematics from algebraic notation, determinants, and linear equations—through differential caculus, curve analysis, integration, summation, etc. Graphical explanations and illustrations aid the engineer in applying methods set forth for solving problems. This new 3rd edition includes much added material on differential equations, dimensional analysis, and practical engineering applications of the Buckingham pi theorem. **By Raymond Dull, and Richard Dull, Webster-Chicago Corp. 522 pages, illus., $7.50**

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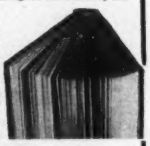
3. A practical book that shows you how to estimate construction costs quickly and accurately. Gives step-by-step instructions for estimating construction work of all kinds, including excavations, all parts of buildings, concrete, structural steel, and material transportation, profit, overhead, etc. **By H. E. Pulver, Prof. of Civil and Structural Engineering, U. of Wisconsin. Second edition, 653 pages, $7.00**



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4. Condensed into this one book are all the tips, methods, and techniques essential to more effective rigging practices in industrial and construction operations. Deals with everyday maintenance operations—with the transportation and handling of heavy machinery—with the erection and demolition of smaller size structures. **By W. Rossnagel, 321 pages, over 300 illus., $4.75**

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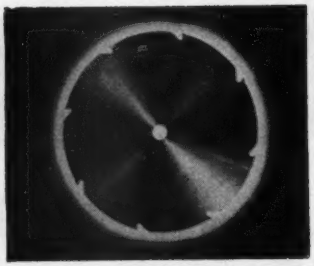


CIRCULAR SAW BLADE has only 8 or 12 teeth—New Safti-Cut blade departs radically from conventional designs with only 8 or 12 teeth instead of the usual 60 to 100. These cutting teeth project only .020 in. above the non-cutting edge and produce small chips instead of the usual sawdust. Manufacturer says that the small number of cutting teeth prevents loading up of the blade, which often causes cracking. The non-cutting circular edge also controls depth of bits on each tooth and practically eliminates the possibility of kick-back, or pull-in of the operator's hands. Available in 6- to 16-in. sizes with any type arbor hole.—**Western Saw Manufacturers Inc., 1842 W. Washington Blvd., Los Angeles, Calif.**

perfect measurement

Rough "approximations" won't serve an architect, engineer or contractor in the serious business of estimating concrete or determining the proper mixing capacity of a drum.

You want to know *instantly, exactly and in precise units of measurement.* And you can know, simply by reading the AGC Rating Plate on all standard mixers and pavers.

Mixer Manufacturers Bureau

Affiliated with the Associated General Contractors of America, Inc.

CHAIN BELT COMPANY Milwaukee, Wis.	THE JAEGER MACHINE CO. Columbus, Ohio	KWIK-MIX COMPANY Port Washington, Wis.
CONSTRUCTION MACHINERY CO. Waterloo, Iowa	THE KNICKERBOCKER CO. Jackson, Mich.	THE T. L. SMITH COMPANY Milwaukee, Wis.
THE FOOTE CO., INC. Nunda, N. Y.	KOEHRING COMPANY Milwaukee, Wis.	WORTHINGTON PUMP AND MACHINERY CORP. Construction Equip. Div., Dunellen, N. J.

SLEEVE BOLT FASTENER—When driven into a hole by a pnuematic tool, this expansion sleeve-type fastener expands into six prongs at the bottom of the sleeve with the bolt head automatically sinking below wood surface to prevent shearing or damage to materials passing over it. Made in sizes from ¼ to 1 in. diameter; lengths from one in. up; and with hex, round, square, flat or slotted heads, they eliminate need for nuts. Company offers free field demonstrations.—**Square Tool & Die Co., Chicago Drillet Division, 1550 N. Fremont St., Chicago 22, Ill.**

NEW EQUIPMENT BRIEFS

Faceshields feature interchangeable visors for specific types of hazards. Made by: Mine Safety Appliances Co., Pittsburgh 8, Pa.

Eight - foot - long fluorescent units called "Challenger", specially designed for industrial locations by Curtis Lighting Inc., 6135 W. 65th St., Chicago 38, Ill., holds four 48-in., 40-w lamps. Their department S-74 will supply all information.

A safety switch lock has been installed on the new lightweight models produced by **Beaver Pipe Tools Inc.** of Warren, Ohio, which makes it impossible to start the machine until the chuck wrench has been removed from the chuck and placed in its holder. This feature replaces the old style wrench ejector which threw out only special types of wrenches.

Wearers of hard hats out on the job will be pleased to hear of a new **sponge rubber shock-absorbing pad** that may be attached to their helmets by merely pressing the affixed self-adhering strip firmly against the hat under the headband. Manufacturer, **E. D. Bullard Co.**, 275 Eighth St., San Francisco 3, Calif., says that sizing features of the safety hats are retained, and standard headband assemblies may be used.

Engine analyzer contains six separate testing units made by **King Electric Equipment Co.**, 9123 Inman Ave., Cleveland 5, Ohio. They are: a coil ignition tester, spark plug tester, condenser tester, VAR tester, cam-angle tachometer tester and an exhaust gas analyzer. Full information on unit is available from the manufacturer.

Plankweld, a pre-finished plywood wall panel available previously only in birch and oak, is now being made in Philippine mahogany and knotty pine, **United States Plywood Corp.** announces. Their Orangeburg, S.C. and Seattle, Wash. plants are manufacturing it.

THOROSEAL *Restored* this Filtration Plant

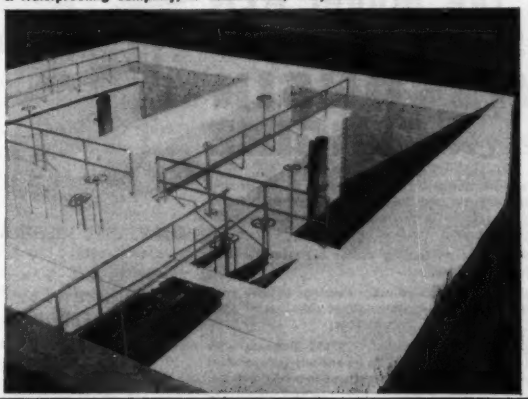
BEFORE

Example of complete break-down of masonry, due to penetration of water into body of concrete and action of frost in damp masonry.

It is amazing how THORO System products will correct a condition, such as shown in photograph. Concrete was sandblasted to remove all disintegrated material to sound concrete surface and reinforcing rods. Patching was done with THORITE Patching Mortar, bringing blistered areas to true and even lines, followed by two applications of WHITE THOROSEAL for protection.

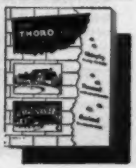
AFTER

At minimum cost, almost ⅓ the cost of other methods, concrete restoration, patching and surface protection was completed with THORO System products on Filtration Plant in Keyser, West Virginia. Contractor: Standard Construction & Waterproofing Company, of Cumberland, Maryland.



WATERPLUG	THOROSEAL	QUICKSEAL
To Stop Leaks	To Seal Surface	For Beautiful Finish

Our 20-page Brochure describes, in detail, how The THORO System products can benefit you in your construction plan. Send for brochure today, which shows methods of application and how to use the material.



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Marvel-Schebler Carbureters are specified as original equipment on many leading industrial engines and tractors because they give maximum dependability and economy.

Any engine runs better and costs less to operate with a new Marvel-Schebler Carbureter. So, make your replacements with Marvel-Schebler Carbureters. *And remember this!* Engineers recommend that the carbureter on heavy duty equipment be completely rebuilt or replaced after 800 work hours of service in the interest of better performance and lower operating costs.

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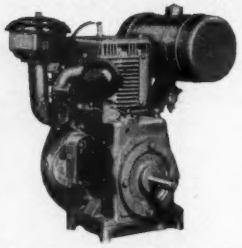
MARVEL-SCHEBLER PRODUCTS DIV., Borg-Warner Corp., Decatur, Ill.

The POWER ADVANTAGE Story of the Model AEN Single-Cylinder WISCONSIN *Air-Cooled* ENGINE



Here's more power . . . less weight . . . lower cost . . . all with no sacrifice in heavy-duty construction and serviceability in this Model AEN single-cylinder Wisconsin Engine. Features include:

1. Dependable air-cooling under all climatic and weather conditions.
2. Self-cleaning tapered roller bearings at both ends of the crankshaft withstand either side-pull or end-thrust without danger to bearings.
3. Rotary type high tension OUTSIDE Magneto with Impulse Coupling operates as an entirely independent unit that can be serviced or replaced in a few minutes.
4. Maximum torque at usable speeds for equipment that really has to go to work.

Our engineering department will gladly cooperate with you in adapting Wisconsin Engines to your requirements. Write for detailed data and name of the nearest Wisconsin distributor.

CONDENSED SPECIFICATIONS

Bore	3"
Stroke	3¼"
Piston Displacement	23 cu. in.

HORSEPOWER

5.1 H.P. at 1800 R.P.M.
6.4 H.P. at 2200 R.P.M.
7.2 H.P. at 2600 R.P.M.
7.5 H.P. at 3000 R.P.M.

No. of Piston Rings	4	
Fuel Tank Capacity	1.7 Gals	
Weight, lbs.	Net	Crated
Standard Engine	110 lbs.	135 lbs.

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46 WISCONSIN

New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

CATERPILLAR CATALOGS — Latest Caterpillar catalogs include Form 30186 on the new 8SR dozer especially designed for rock and other heavy-duty jobs; Form 30160 on the DW20 and DW21 tractors; and Form 30178 illustrating the wide usage of diesel-electric sets for various power applications.—**Caterpillar Tractor Co., Peoria 8, Ill.**

PHOSCOTE PROCESS — Eight-page booklet completely describes Phoscote process of pickling and painting steel plates, angles, channels, and other shapes produced by rolling. It provides a clean, dry surface with a coating of iron phosphate that improves the bond between the prime coat of paint and the steel. The booklet contains photographs and drawings showing various operations during Phoscote processing, and photographs of completed structures built of plates and shapes treated in this manner.—**Chicago Bridge & Iron Co., 332 S. Michigan Ave., Chicago 4, Ill.**

PERIMETER INSULATION—Twenty-page booklet contains information on perimeter insulation for standard heating systems. It features diagrammatic sketches illustrating proper method of installing the insulation. Explains the theories involved in perimeter insulation, and illustrates how Fiberglas products help provide a desirable effect.—**Owens-Corning Fiberglas Corp., Toledo 1, Ohio.**

SLACKLINE CABLEWAY EXCAVATOR—28-p catalog on where to use, when to use and cost of using this machine which the manufacturer claims can dig, convey, elevate and automatically dump materials all in one motion. More than 100 action photographs are included, showing the rig at work in gravel and clay pits, reservoirs, earth dams, etc. General Catalog, Section C.—**Sauerman Bros., Inc., 532 S. Clinton St., Chicago 7, Ill.**

PIPE COUPLINGS — Featuring speed and simplicity of connection of their wedge-type couplings, this company's illustrated bulletin claims that the only tool needed is a hammer. Complete specifications are included in range of lightweight pipe sizes from 8 to 30 in. in dia. Four step-by-step photos tell the whole story.—**Naylor Pipe Co., 1230 E. 92nd St., Chicago 19, Ill.**

Rodgers Hydraulic JACKING EQUIPMENT...

- JACKING CYLINDERS (50 TO 600 TONS)
- HAND AND POWER PUMPS
- QUICK COUPLERS
- VALVES AND HOSE

Photo shows two Rodgers 300-Ton double-acting jacking cylinders (operated by Rodgers power-driven hydraulic pumps) jacking 72" compressed concrete pipe. Hose connects cylinders with pump.

SAVES YOU TIME AND MONEY ON JOBS LIKE THESE...

SEND FOR NEW CATALOG

To learn advantages of Rodgers Jacking Cylinders on construction jobs . . . get the new Rodgers Catalog No. 317. It gives full information.

Wherever you need versatile, efficient jacking power on the job — you'll want a Rodgers jack. A complete selection of hydraulic cylinders in various capacities and lengths of ram travel are available — to be used with either hand-operated or power-driven hydraulic pumps.

Cylinders may be operated either singly or as a group for a straight jacking of compressed concrete pipe, corrugated pipe, well casing, etc., or used in the operation of the shield jacking method. Two sizes of quick couplers, 4-way and metering valves, and high pressure hose are available accessories.

Complete specifications, illustrations and suggested uses are included in the new Rodgers Jacking Equipment Catalog.

- JACKING COMPRESSED CONCRETE PIPE
- JACKING CORRUGATED PIPE
- JACKING WELL CASING
- JACKING SHIELD FOR TUNNELING

HYDRAULICS Rodgers

Rodgers Hydraulic, Inc.

7403 WALKER ST., ST. LOUIS PARK, MINNEAPOLIS 16, MINN.

HYDRAULIC POWER EQUIPMENT

MC Self-Raising Tower-Hoist

THE INDUSTRY'S MOST VERSATILE

- Picks itself up • Easily extends
- Lifting heights up to 94 feet
- Single or Double Drum Hoists
- Platform speed—100 ft. per min.
- Lifting capacity—2,500 lbs.

Optional Equipment: **Gin Pole Assembly, "Chicago" Boom, Tip-Over Bucket, Truck Mounting, Interchangeable 10' Extensions.**

CONSTRUCTION MACHINERY COMPANIES
WATERLOO, IOWA

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT: BUSINESS: **"OPPORTUNITIES"** :EQUIPMENT :USED OR RESALE

DEPARTMENT OF HIGHWAYS AND PUBLIC WORKS
PROVINCE OF NOVA SCOTIA

TENDERS FOR POWER SHOVELS, TRACTORS AND CRUSHING PLANT

Sealed Tenders, addressed to the Minister of Highways and Public Works, Halifax, Nova Scotia, will be received up to noon, Standard Time, Saturday, September 22nd, 1951, for the purchase of one or more of the following power shovels with subsidiary attachments and spare parts, one or more of the Caterpillar Tractors with Bulldozers, and one complete crushing plant intact, as described below:

1 Lorain 77 S 1½ Yd. Shovel, powered by Caterpillar Diesel Model 1300. Complete with Shovel Front, 45 ft. crane and clam boom, together with spare parts on hand valued at $566.95.

1 P & H 655A, 1½ Yd. Shovel, powered by Caterpillar Diesel Model 1300. Complete with Shovel Front, together with spare parts on hand valued at $1,670.87.

1 Link Belt K45, 1½ Yd. Shovel, powered by 4 cylinder Waukesha Gas Engine, together with spare parts on hand valued at $1,809.25.

1 Lorain 75B, 1¼ Yd. Shovel, powered by 4 cylinder Waukesha Gas Engine, together with spare parts on hand valued at $170.40.

1 Link Belt K25, 1 Yd. Shovel, powered by 4 cylinder Waukesha Gas Engine, Complete with Shovel Front, together with spare parts on hand valued at $2,220.50.

1 P & H 600, 1 Yd. Shovel, powered by Atlas Imperial Diesel Engine, complete with Shovel Front, 46 ft. crane boom, 23 ft. extension, Fair leads and attachments, together with spare parts on hand valued at $321.50.

4 Caterpillar D8 Tractors with Caterpillar Hydraulic Bulldozers.

1 Pioneer 46VE Gravel Crushing Plant, powered by Caterpillar Diesel Engine, Model D17,000 directly connected to an electric generator set for the purpose of furnishing power for independent motor drives on the plant. Complete with all conveyors, etc.

Inspection of this equipment may be made, and full information obtained on application to Mr. K. A. Forbes, Mechanical Engineer, Department of Highways and Public Works, Halifax, Nova Scotia. All machines are in first class working condition and a demonstration can be arranged.

Each tender for the above mentioned equipment must be accompanied by an accepted bank cheque payable to the Department of Highways and Public Works of Nova Scotia for 10 per cent of the amount of the tender and this cheque will be forfeited to the Department of Highways and Public Works if the accepted tender fails to pay to the Department within thirty days the balance of the amount tendered.

The lowest or any tender will not necessarily be accepted.

Halifax, Nova Scotia
July 26th, 1951

MERRILL D. RAWDING
Minister of Highways & Public Works

CLAY PRODUCTS—Released for particular interest of architects, contractors and builders this two-color condensed bulletin illustrates the broad range of clay products in construction work today, including solid and perforated clay pipe, liner plates, clay flue linings, chimney tops, bases, vitrified clay meter boxes, Lap-Lok wall copings and septic tanks with burned-in baffles. Write to—**A. E. Williams, The Robinson Clay Product Co., Akron, Ohio.**

AC ARC WELDERS—Describes complete line of transformer type welders for all applications of the Heliarc process, with charts, specifications, and recommendations for automatic control panels and Heliarc spot welders.—**Miller Electric Manufacturing Co., Appleton, Wis.**

EXCAVATORS—Starting with Model 33H, a standard ¾-yd shovel, this 32-p, two-color Bulletin No. 403 shows working views of the entire line of Marion machines along with crane-lifting capacities, condensed specifications, and types of service to which the machines can be converted—shovel, clamshell, dragline, crane, backhoe, piledriver, coal loader, etc. Spanish and French translations are now in process. Write to any sales representative, distributor, or—**Marion Power Shovel Co., Marion, Ohio.**

HARD-FACING ELECTRODES—Proper applications of new line of Wear-Arc hard-facing alloy electrodes are described in this booklet for many industries, with a special section on construction, excavation and dredging machinery parts.—**Alloy Rods Co., York, Pa.**

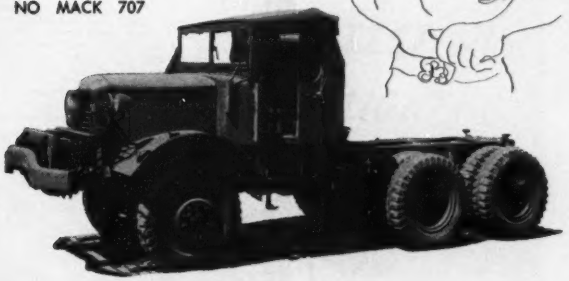
TRACTORS ON PIPELINE WORK—Spectacular pictures and information on how problems were solved and delays averted on pipeline jobs fill this 12-p booklet titled "International Power Lowers the Boom on Pipelaying Costs." Every phase is included from the clearing and leveling to lowering in, backfilling and cleanup. The front page has a Selectograph showing full range and lifting capacities of five sizes of superior sidebooms which match the TD series of tractors.—**International Harvester Co., 180 N. Michigan Av., Chicago 1, Ill.**

WALL FORMING SYSTEMS—Incorporated in this new 34-p catalog is all of the latest information and improvements in the Symons forming system. Illustrations show in detail how simply the units can be installed. Actual jobs are well illustrated. Also included are typical blueprints, complete specs, material and equipment needs, cost and time figures on actual jobs. Manufacturer offers a free form layout of your job without obligation if you'll just send him the plans and specs.—**Symons Clamp & Manufacturing Co., 4249 Diversey Ave., Chicago 39, Ill.**

BUILT-

. . . to take it-
and dish it out!

NO MACK 707



Write for the latest complete Military Parts Catalog.

Factory-Processed NEW- Guaranteed 6x6's

Why send a boy out to do a man's job when you can have power to spare with these "Super-Trucks." Yes, they are built to take your special equipment and crane mountings over rough terrain and "Stand Up" under gruelling work periods. These trucks are the best of Army Surplus stocks and are processed in our modern shops . . . they are absolutely guaranteed to give you satisfaction. Let us recommend the trucks best suited to your heavy equipment requirements, such as crane mountings, rock dumps, trailer dumps, drilling or logging rigs.

The following 5 to 25 ton 6x6's are available for immediate delivery . . . GMC 6x6, NM MACK, NO MACK, INTERNATIONAL, DIAMOND-T, WHITE DIESEL, HALF-TRACK

ZELIGSON
TRUCK and EQUIPMENT COMPANY

"FASTER FROM FOSTER"

RAILS NEW AND RELAYING

RENTAL PILING STEEL SHEET

• Five complete warehouse stocks assure you of the exact requirements for all your job needs. Largest stocks in U.S. of Relaying Rails and Rental Steel Sheet Piling. Also complete Track Accessories. Pile Hammers and Extractors for rent. Write for Catalogs.

TRACK ACCESSORIES • PIPE • WIRE ROPE

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HAISS BUCKET LOADER
Late Model—Type 80 Crawler
Hydraulic Controls
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Available Immediately — Subject to Prior Sale

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Heincke ¾ yd. clam
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Wellman ½ yd. drag
Hendrix ⅝ drag
Page ¾ yd. RC drag
Hendrix 2½ yds. HS drag
Concrete buckets ½-¾-1 yd.

CRANES
P & H 600
Insley K-12
Lima 34
P & H 150
Bucyrus-Erie 1035
Bucyrus-Erie 10B
Insley K-12 shovel front
Insley K-12 hoe attachment
P & H 150 shovel front
P & H 150 hoe attachment
Lima 602 shovel attachment
35' boom for Koehring 376
Lima 34 hoe attachment

GRADERS
Gallon 104
Gallon 118
Caterpillar 10
Gallon 1HC
A.C. "W" Patrol

LOADERS
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Adnun black top
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Gallon 10 ton 3 wheel
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TRACTORS
A.C. HD7 w/Bake- blade
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Highway Spreader
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125 ft. 24" Conveyor
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Pumps all sizes
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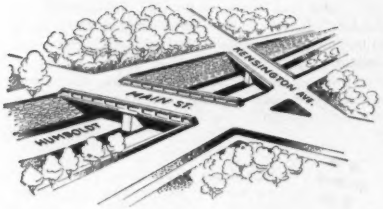
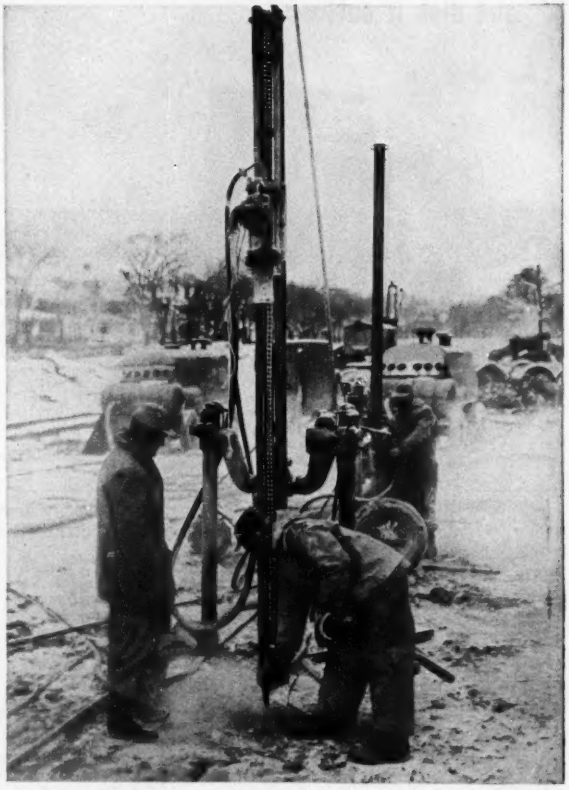
"SEARCHLIGHT SECTION"
The meeting place of Used Equipment Buyers and Sellers

70,000 Cubic Yards of Rock Blasted to Underpass Busy Buffalo Intersection



When three busy traffic arteries intersect there's bound to be a problem. Relief for one such situation is now under way in Buffalo. Main Street and Kensington Avenue are being underpassed by a four-lane, divided stretch of Humboldt Parkway about six blocks in length. This $2 million project will speed the flow of traffic and greatly reduce noise and confusion, as well as enhance the neighborhood.

The contract, awarded to Brunner Brothers, of Buffalo, by the New York State Department of Public Works, calls for 70,000 cu yd of rock excavation and about 7000 cu yd of trench and culvert work. Edward A. Besch & Sons, also of Buffalo, is the sub-contractor for all rock removal. Drilling and blasting right through the winter months, the contractors have relied exclusively on Bethlehem Hollow Drill Steel to bore about 150,000 ft of hole in hard, flint-streaked rock.



This chilly scene in February shows the wagon drills running full tilt as Bethlehem Hollow Drill Steel bites through hard gray lime in the initial stages of the excavation work.

Edward Penkalski and Charles Besch of Edward A. Besch & Sons, of Buffalo, examine the carbide-tipped, detachable bits used on rods of 1¼-in. round Bethlehem Hollow Drill Steel. Holes range up to 15 ft in depth. This project is scheduled for completion in December, 1951.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM HOLLOW DRILL STEEL

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IT'S NEW!

IT'S DISSTON!

IT'S THE BEST IN LIGHT-WEIGHT SAWS!

Featuring—
New,
Fast-Cutting
Chain
Narrow
Slotted
Guide Rail

Here is a new model of an old woods favorite—the tough, light-weight DO-101 Disston One-Man Chain Saw. It has a sturdier crankshaft, a reinforced rear handle, new rapid-action toggle stop-switch and many other advanced features for harder use and longer life. And, for smoother, faster cutting, the DO-101 is equipped with Disston's new fast-cutting "DF" chain. Running on a narrow profile slotted guide rail, this chain cuts a kerf that minimizes binding. Can be sharpened by hand on the rail in a matter of minutes.

Don't take our word that a Disston is just about the finest cutting tool that's ever come your way. Ask anyone who has ever handled a Disston. Then see your Disston Dealer. He'll let you try out one of these beauties for yourself. Once you feel that steady power safely under your command and effortlessly guide the chain through a cut, you won't rest until you own one of these time-saving money-makers yourself.

Don't forget, Disston also makes the powerful DH-120 12-hp Two-Man Extra Duty Chain Saw . . . a favorite the world over.

FIGHT WASTE

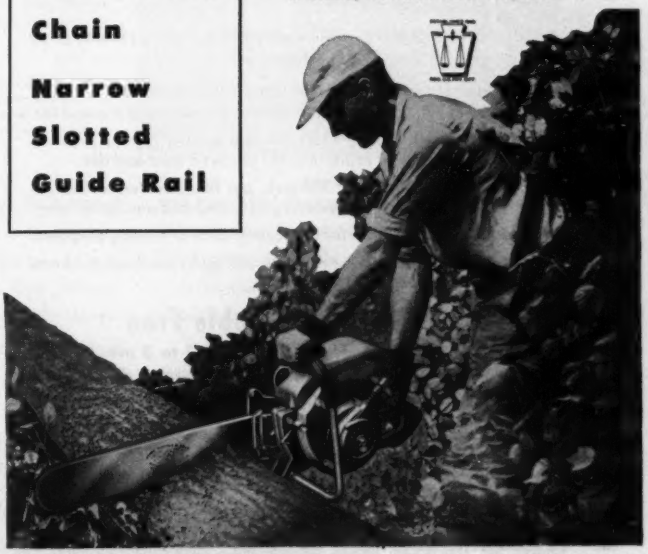
A tip for present Disston Saw Owners . . .

Follow the simple FIGHT WASTE preventive maintenance instructions which are available to you free of charge. Send for the valuable check-up charts, the illustrated maintenance folder, the detailed handbooks. Above all, rely on the services of your Disston Dealer.

HENRY DISSTON & SONS, INC.

I-4 TACONY, PHILADELPHIA 35, PA., U.S.A.

In Canada, write: 2-20 Fraser Ave., Toronto 3, Ont.



THE DO-101 ONE-MAN SAW. 2-cycle, single-cylinder engine. Positive action clutch. Instant-starting, self-rewinding Magnapull Starter. Automatic chain lubricator. Fast-cutting "DF" chain and slotted profile guide rail in 20", 26", 32", 36", 40" lengths. Also available are 18" and 24" rails with straddle type chain and 15" bow saw for speedy bucking and limbing. Helper handle available for two-man operation.

NEW Malsbary Model 250 Cleaner Cuts Cleaning Time in 1/2

Blasts Dirt, Mud and Grease from Construction Equipment with 250 lbs. Pressure and Lots of Hot Cleaning Solution

Malsbary's NEW 250 gives you all the requirements for fast cleaning —soap, water, heat and high pressure. With it you can clean a D8, TD24, or HD19 tractor in 2 hours or less . . . it takes 4 to 8 hours to do the same job with conventional steam vapor cleaners. The 250 will clean bridges, buildings, etc., up to 300 feet distant from cleaner, with but little loss in pressure.

5 DIFFERENT CLEANING ACTIONS

Only Malsbary, with its patented pumping system, gives you all these other advantages:

High Pressure Steam Cleaning—*200 gals. per hour at 325° F. and 150 to 200 lbs. pressure to remove grease, road oils and tar.*

High Pressure Cold Water—*300 gals. per hour at 250 lbs. pressure for cold rinse or rapid removal of caked mud and dirt.*

High Pressure Hot Water—*300 gals. per hour, heated to 180°, at 250 lbs. pressure for removing oil-caked mud and for de-icing.*

Low Pressure Wet Steam—*for de-gassing tanks & heating purposes.*

Low Pressure Warm Water—*up to 300 gals. per hour for hand washing trucks and equipment.*

Quick Starting, Trouble Free

Malsbary's NEW 250 develops hot solution in 2 to 3 minutes, has capacity for 5 hrs. continuous cleaning. *Simple, rugged, dependable* —no gadgets to get out of order. Oil or gas fired; stationary, portable or trailer mount. Write us NOW for Bulletin No. 125 and name of your nearest dealer.

Big Equipment Yards with lots of heavy-duty cleaning work or jobs requiring 2 or more cleaning guns will find Malsbary's Series 300 and 500 Cleaners (pressures up to 400 lbs.) big time and cost savers. Catalog on request.

MALSBARY MANUFACTURING CO.

Room 209, 845 92nd Avenue
Oakland 3, California

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WHERE TO BUY

STOP *that* WATER

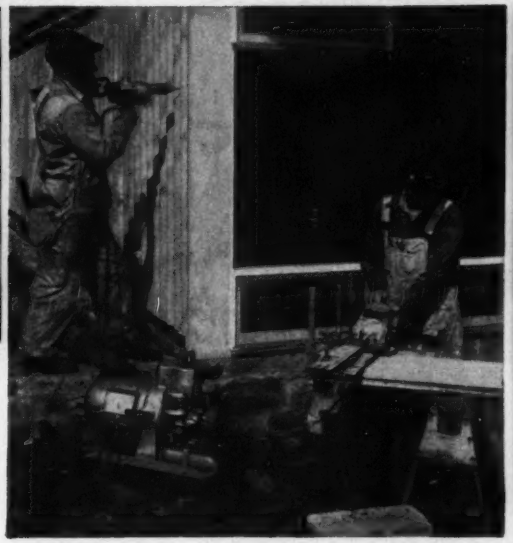
WITH FORMULA NO. 640. A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals —holds 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs: Applies quickly—no mixing—no cleanup—no furring —no membranes. Write for technical data—free sample. Naynos Products Co., Omaha, Neb.

To every Contractor who wants to Save Money with

HOMELITE

Carryable EQUIPMENT

Use Homelite Gasoline Engine Driven Pumps for faster dewatering. One man sets it up . . . gets it going instantly . . . any place. Fastest automatic self-priming. Non-clogging. 28 foot suction lift. And handles up to 15,000 gallons per hour.



Use Homelite Gasoline Engine Driven Generators to operate power tools or floodlights. No delays . . . no waiting for power installation . . . no long hazardous and power hungry cables. Several models including new dual purpose generator that operates both high cycle and standard universal tools.

Act now! Homelite Carryable Pumps and Generators are not too easy to get. There are delays in deliveries. But with a wise eye to the future it's better to order a Homelite for as early as possible delivery, than pick up some inferior piece of equipment that might be hanging around. After all, the present building boom isn't going to burst overnight. Predictions point to months, yes *years* of intensive building activity. And to keep pace with the program, you'll need all the time-saving, cost-cutting equipment you can get. You'll need equipment that will really stand up under rugged, *steady* use . . . dependable equipment like Homelite Carryable Pumps, Generators and Chain Saws.

Write today for complete information on the availabilities of Homelite carryable equipment . . . Pumps, Generators and Chain Saws.

Manufacturers of Homelite
Carryable Pumps • Generators
Blowers • Chain Saws

PERFORMANCE • DEPENDABILITY • SERVICE

HOMELITE
CORPORATION
1009 RIVERDALE AVENUE • PORT CHESTER, N. Y.

Methods Memo . . .

SPIKE SEZ: Those piles are valuable! I mean the piles of scrap in contractors' yards. They are valuable to the defense effort and scrap steel brings a good price. Why not turn in the stuff where it will do some good?

GOOD WILL FOR CONSTRUCTION MEN ran rampant in Bluefield, W. Va., recently when a dozen earthmoving contractors and coal strippers put their bulldozers, shovels and trucks to work in a mass attack on a recreational site for the city—for free. Like most municipalities, Bluefield has been struggling with a tight budget and plans for increased recreational facilities. The construction volunteers, led by Rish Equipment Company's Roy Hill, scooped out a site for a swimming pool and sheared off a mountaintop behind it for a picnic and play area. The $75,000 job was completed in less than three days.

CONSTRUCTION EQUIPMENT MAINTENANCE work needed by the armed forces may be farmed out to commercial firms. The Munitions Board is developing a plan whereby each of the services will work out military equipment repair needs with private firms to absorb maintenance loads, to keep abreast of schedules and to prevent backlogs. One purpose is to keep to a minimum the construction of military shop facilities, with its attendant investment in tools and equipment. Other reasons are to assist small business and to broaden the industrial base of military supply. Although no specific type of military equipment has been mentioned up to now, maintenance of construction machinery should be one category where commercial operators can fill the bill for the government—and probably save Uncle Sam some money to boot.

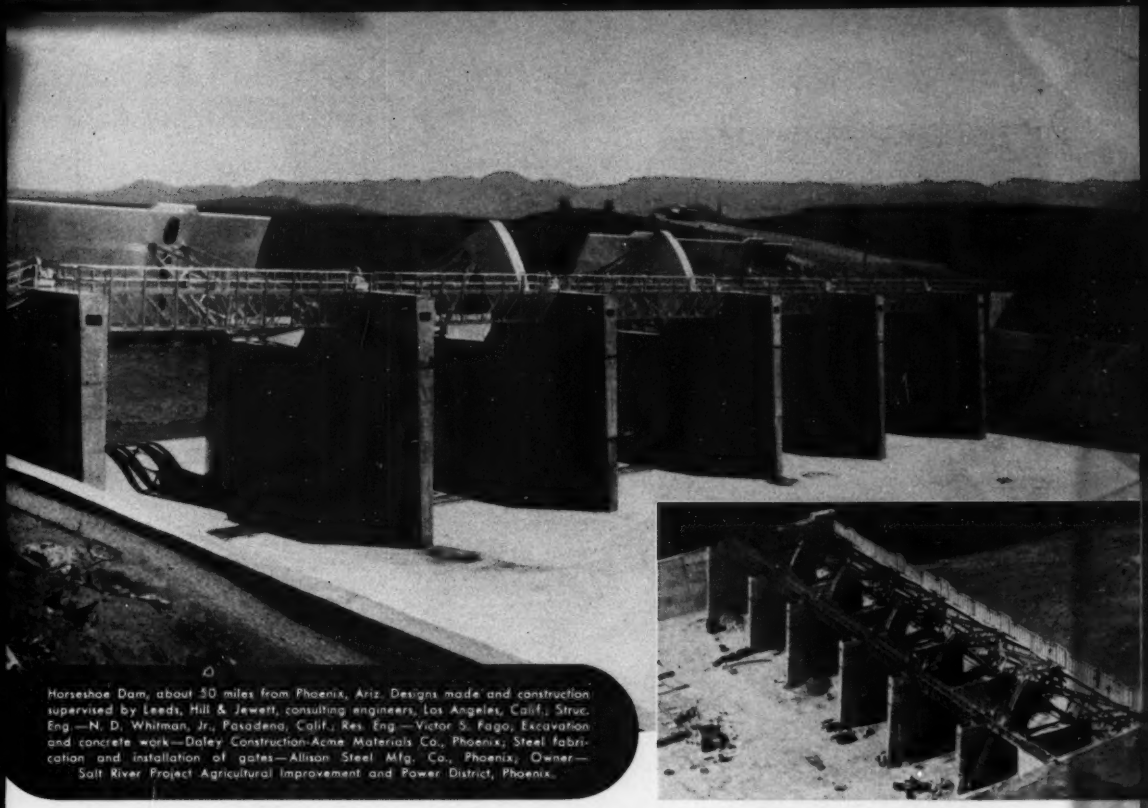
GREATER USE FACTOR for construction equipment is a possibility in many areas of the country where winter layoffs occur and where snow removal is a major winter occupation. Highway officials particularly have reported that they are enthusiastic about renting contractors' equipment for snow removal, thereby avoiding the large investments required for snow-removal machinery—which is idle most of the time. For example, each highway maintenance district in Minnesota has a list of contractors' machinery available in that area to supplement the state's snow removal facilities. Through the joint effort of the contractors and highway maintenance crews, it proved possible to open almost all Minnesota roads within one day after the several severe storms of the last winter. It is not too early to start thinking along this line and to acquaint highway departments with what you can do for them next winter.

TO REDUCE CONSTRUCTION ACCIDENTS, the National Constructors Association, made up of large companies engaged primarily in the construction of chemical plants, petroleum refineries and steel mills, is conducting a safety program aimed at making real reductions in lost-time accidents on building projects. F. R. Griffin, chairman of NCA's Safety Committee, states that special awards will be presented to member-companies that show improvements in their safety records on the basis of accident reduction both in frequency and severity. Ratings will be established for each member.

On the Cover

IT WAS A CLEVER TRICK they pulled down in Atlanta in lifting a crane on skids to the 7th, then to the 11th and 15th floors to erect all steel above the 7th floor on a 17-story apartment. That little blob of red in the upper left center of the cover picture is a Shield Bantam crane working from the 11th floor.

Atlanta Steel Erectors set the steel for Long Construction Co. Read all about how they did it on page 54 of this issue.



Horseshoe Dam, about 50 miles from Phoenix, Ariz. Designs made and construction supervised by Leeds, Hill & Jewett, consulting engineers, Los Angeles, Calif.; Struc. Eng.—N. D. Whitman, Jr., Pasadena, Calif.; Res. Eng.—Victor S. Fago. Excavation and concrete work—Daley Construction-Acme Materials Co., Phoenix; Steel fabrication and installation of gates—Allison Steel Mfg. Co., Phoenix; Owner—Salt River Project Agricultural Improvement and Power District, Phoenix.

POZZOLITH CONCRETE In Dam With World's Largest Radial Gates *

The increasing use of Pozzolith Concrete in noteworthy structures, like this $900,000 reservoir enlargement project, results from the fact that Pozzolith has proved to be the most economical means of meeting concrete requirements.

Here the problem was to obtain easy placeability yet maintain designed strength, since the piers were comparatively thin sections (see small photo) and heavy with steel reinforcement. The answer was Pozzolith . . . because it improves workability even with total water cut as much as 15%.

Pozzolith's cement dispersing, water reducing action, plus its entrainment of the *optimum* amount of air, also produced these concrete properties:

- MINIMUM SHRINKAGE
- GREAT DURABILITY
- LOW PERMEABILITY
- GOOD APPEARANCE
- HIGH BOND OF CONCRETE TO STEEL

Over 8,000,000 cubic yards of Pozzolith Concrete placed in 1950 alone testify to Pozzolith's ability to produce better concrete at lower cost. *May we send you complete information and the Pozzolith booklet?*

**Close fitting pre-cast bascule weights which counterbalance the gates, also I-beam seal at bottom of gates, were precision grouted with EMBECO — another Master Builders' cement dispersion product, which produces non-shrink grout and mortar.*

the MASTER BUILDERS Co.

CLEVELAND 3, OHIO — Subsidiary of American-Marietta Company — TORONTO, ONTARIO

300,000 YARDS

maintenance still too low to be figured

Two of the eight Worthington Blue Brute Wagon Drills that broke cost records for Rock Construction Corporation. Note the amount of line drilling.

President Walt Dunham and Engineer A. Bruce Lattanzi in the company's Downsville Dam office.

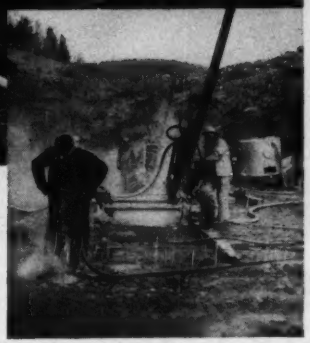
Two 500' Worthington Blue Brute Air Compressors supplying air for drills at the Downsville Dam.

Line drilling in blue stone is child's play to those Worthington Blue Brute Wagon Drills.

Rock Construction Corporation of Kingston, New York, working on the Downsville Dam weir and waste channel, got service out of eight wagon drills that constantly amazed them.

Walt Dunham, president, reported: "We have drilled as much as 700-800 feet per 8-hour day per machine. In 165 working days, the machines put out 300,000 cu yds with so little maintenance it can't be figured in cost per yard."

This job also used a number of Worthington Blue Brute Hand-Held Rock Drills. Says Mr. Dunham: "There has been absolutely no maintenance cost. Our operators like them better than anything they have ever used."



Worthington Blue Brute Rock Drill operating ahead of the wagons collaring hole for laying out line drilling.

Contractors everywhere know that a Worthington Blue Brute team—air compressor and tools—makes mincemeat out of even the toughest jobs. See your nearby Worthington distributor for a demonstration. Worthington Pump and Machinery Corporation, Construction Equipment Division, Dunellen, N. J.

WORTHINGTON

BUY BLUE BRUTES

H.1.5